Socio-Economic Impact Of Hog Operations In Alberta

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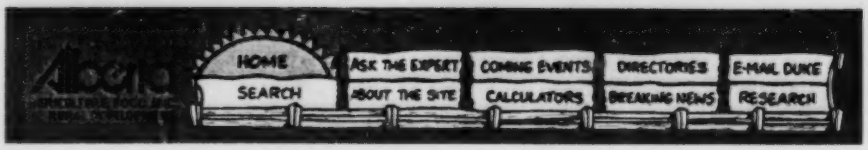

Socio-Economic Impact Of Hog Operations In Alberta

This study, the Socio-Economic Impact of Hog Operations in Alberta, was undertaken in two phases: The first phase of the study involved the development of a producer survey based tool to estimate industry-specific economic multipliers for the on-going hog operations in different types of rural communities. Benefits are estimated based on the number of employees, the number of additional jobs that this spending supports and the income generated by the spending. The second phase of the study relies upon the application of multipliers to five specific expansion and/or investment projects to quantify the magnitude of economic benefits; interviews with immediate and surrounding neighbours of the case studies to help clarify the nature and specific source of any concerns; and community focus group meetings within the case study communities to further supplement the social and environmental management information materials.

The project was funded by the Alberta Pork Producers Development Corporation (APPDC) and Alberta Agriculture, Food and Rural Development (AAFRD). The Canada/Alberta Hog Industry Development Fund, a new Federal-Provincial Industry Development Fund administered by the Alberta Pork Producers Development Corporation, financially supported this study with a grant. The Agriculture and Food Council of Alberta have financially supported this study by a grant from the Canadian Adaptation and Rural Development Fund that it administers on behalf of Agriculture and Agri-Food Canada.

The consulting team would like to acknowledge the assistance provided by AAFRD, especially Ms. Louise Starling and Mr. Murray Davison of the Livestock Expansion and Development Team, in conducting the neighbourhood surveys and community focus groups. Any errors, omissions or mis-interpretation remain the responsibility of the consulting team.

A large number of industry stakeholders, producers and specific community members, provided their valuable time to meet and share their production and market information and their perspectives and concerns regarding expansion of intensive livestock operations. It is this information which forms the basis of our report. Although it is not possible to convey all the comments made during the process of this investigation, it is our opinion that the report reflects a fair representation.

This information is maintained by Murray Davison
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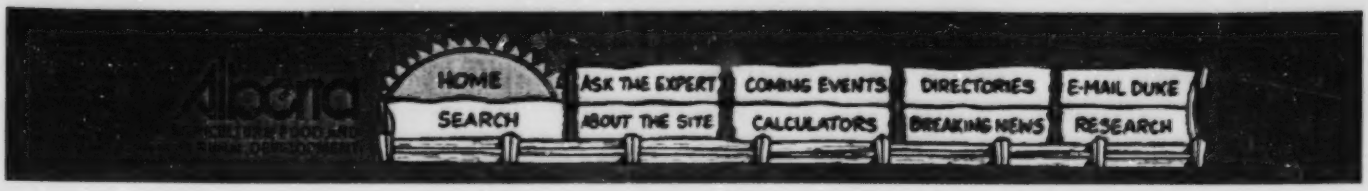

Executive Summary

Socio-Economic Impact Of Hog Operations In Alberta

[Introduction | Study Findings]

Introduction

The Alberta pork industry has more than doubled in terms of hog numbers since 1976, with a growth rate of over 4.2% per year and is the third largest among Canadian provinces in terms of hog numbers. Alberta produced 1.87 million head in 1986, and over 2.77 million head in 1996. Hogs slaughtered in Alberta in 1997 was estimated at over 2.5 million head, nearly 16.5% of Canadian production.

Restructuring and consolidation of the swine industry is occurring provincially, nationally and globally. Alberta hog production is poised for considerable expansion.

There needs to be a balanced response to the environmental challenges facing Alberta's agri-food industry through the development of: education/tech-nology transfer, research, regulation, and monitoring.

Other issues to be dealt with include:

- Little factual information exists to adequately evaluate the benefits of hog operations to local and regional rural communities. A tool to aid in evaluation of hog operations that can be customized for their community is required.
- Recent controversial publicity about water quality and environmental concerns related to the pork and other intensive livestock industry has lacked the perspective needed to make fact-based decisions about important industry issues. Stakeholders need to learn about current hog production practices and what producers are doing to eliminate/minimize adverse effects on their surroundings.
- No direct correlation has been clearly identified between the size of a pork production operation and its environmental impact. All operations must be able to meet regulatory requirements through the prior planning and/or new or continued investment in the operations.

To address these issues, a study on the Socio-Economic Impact of Hog Operations in Alberta was completed for Alberta Pork Producers Development Corporation (APPDC), and Alberta Agriculture, Food and Rural Development (AAFRD), by Serecon Management Consulting Inc.

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Conceptual Study Framework

Social and economic implications of hog production can be assessed using two components:

- an economic impact analysis to estimate the impact on income and employment within specific communities, regions, or the province as a whole; and,
- a social impact analysis to identify and assess demographic, local government and community concern.

As a result, this study is comprised of two phases.

Phase I: Economic Impact of Hog Production in Alberta

The economic impact analysis used to examine hog production in Alberta is based on the concept of an economic multiplier. The multipliers used in this analysis were for income and employment.

The analysis of economic impact hinges on three key factors: the proximity of the hog operation to the nearest community; the amount of economic activity generated by the hog operations; and, the linkages between the hog operations with other industrial businesses in the community.

Producer Survey: Forty-four (44) in-person interviews were conducted with hog operations across Alberta to obtain detailed information relative to the current year's operation and its employees. Forty-two (42) interviewers included complete financial detail of value to the economic analysis. They also responded to a series of environmental and community relationship questions.

Candidates for interviews were selected from a random sample stratified by region, type of operation and size of operation based on a-priori data from APPDC.

Approximately 77% of the sample were farrow-to finish operations, 16% finishing and 7% were farrow-wean. The sample contained different sized operations distributed as follows:

- <50 sow equivalents – 11%
- 50 – 125 sow equivalents – 30%;
- 125 – 250 sow equivalents – 16%; and,
- >250 sow equivalents – 43%.

Thirty-two percent of the sample was located in southern Alberta, 36% in central Alberta, and 32% in northern Alberta.

Phase II: Integration of Environment and Socio-Economic Development Factors

Specific measures and steps undertaken during the second phase of the study included:

- direct application of the economic multiplier instrument to five case studies;
- survey of adjacent and near property owners to assess neighbour concerns and issues; and,
- community focus groups within the vicinity of the case studies.

Case Studies: Factors taken into consideration in the selection of appropriate case studies in Alberta,

included: stage of development, receptiveness of communities, type and size of operation, environ-mental sensitivity, and municipal experience based on the number of development permits issued.

Five candidates were selected and were regionally dispersed across the province. Four of the cases represent expansion initiatives and one was a new development investment. Two of the projects were recently completed, one was underway, one had plans for construction in just over a year, and another planned start-up within five years. The size of projects ranged from 350 to 1,500 sow operations, four of which were farrow-finish and one a farrow-wean.

Information was gathered relative to future projections of feed use, input spending patterns, labour requirements, capital investment, and measures to address environmental issues of the proposed expansion/investment.

Neighbourhood Survey: A total of 73 individuals in the immediate and surrounding vicinity of the five case studies were interviewed. The immediate area comprised a 1.6 km diameter around the case study site and the surrounding vicinity spanned an additional 2.4 kms.

Community Focus Groups: Five community focus groups were held in the same vicinity as the case studies. Participants included 8 to 12 representatives from the community comprised of bankers, veterinarians, county and town councils, educators, church, health, and environmental representatives. Emphasis was placed on identifying the impacts of intensive livestock operations in the areas of community and municipal relations, infrastructure, quality of life, the economy, and environment.

Study Findings

Phase I – Economic Impact

Operator and Employee Spending Patterns: The typical budgetary spending patterns of both the owner/operator and employee of hog operations were collected. The largest employee and owner/operator expense in the area was food and clothing (25% employee, 32% owner/operator), followed by vehicle expenditures. Both the employee and operator spend greater than 80% of their budget within a 50 kilometer radius of their place of employment.

Labour Expenditure Patterns: The average number of full-time equivalents (FTE's) for paid labour from the surveyed sample was estimated to be 2.44. This included all paid labour for operator, full-time employees, part-time employees and any paid family labour. The full-time equivalents ranged from 0.208 for the smallest size operations to a high of 5.1 for those operations in the >550 sow equivalent category. The average wages reported for full-time equivalent paid labour was $35,256 (ranging from $28,800 per FTE for <50 sow equivalent operations to $36,454 per FTE for the 50-125 sow equivalent category).

Feed and Other Variable Expenditure Patterns: Feed is the major production input to the pork production process, representing 62% of total expenditures, excluding labour. Hog purchases, fixed costs, and other variable costs comprise the balance at 10%, 14%, and 14%, respectively. The amount for feed spent within the 50 km radius ranged from 75% in the Central region to 56% in the North region. Smaller operations purchased a greater proportion of their feed within 50 kms (99% for <50 sow equivalents, and 91% for 50-125 sow equivalents). Operations sized 125-250 sow equivalents and

225-550 sow equivalents purchased less of their feed within 50 km (78% and 60%, respectively).

Other Variable Costs: Expenses included in the other variable cost category are hog purchases, bedding, genetic and veterinarian expense, trucking and marketing, repairs and maintenance, manure disposal, custom work, utilities, etc. Feed expenses and labour costs are analyzed separately. Hog purchases, breeding animals, and weaner and feeder pigs comprised 42% of these types of costs. Utilities and repairs constituted 17% and 14%, respectively. For an average expense of over $157,099 on variable costs, not including feed or labour, approximately 64% was spent within the region. No direct correla-tion was evident between proportion of variable costs purchased regionally and size of operation.

Fixed Expenses: Fixed expenses included miscellan-eous barn expenses, banking, depreciation, property taxes and insurance, office and administration and other. For the sample, the average fixed costs was reported to be approximately $89,500 of which 93% was spent regionally. Lowest fixed expenses were reported by the smallest enterprises ($28,124 for 50 sow equivalents), while the highest were cited by those in the 250 to 550 sow equivalent category ($230,788). Average fixed costs by type of operation, were as follows:

- farrow to wean - $73,730 (97% spent regionally);
- farrow to finish - $88,558 (92% spent regionally); and,
- finishing - $100,565 (100% spent regionally).

Capital Expenses: The average replacement value of the surveyed sample was estimated to be approx-imately $1,554,000, not including breeding stock. Capital expenses were the largest for >550 sow equivalent operations (double all other size categories) at just over $4,000,000. The largest capital expenditures by region occurred in the central region with an average in excess of $2,000,000.

Generated Multipliers: Estimated local wage multipliers (impact of subsequent spending of wage income in the local economy), as well as provincial employment multipliers (dependent on the basic and non-basic make-up of the Census Division) were reported for six sample Census Division in the South, Central, and North regions. Local wage multipliers increased as the nearby centre gained functionality. They ranged from 1.08 in a Minimum Convenience Centre to 2.87 in the highest functional classification centre. Provincial employment multiplier values for the six sample Census Divisions averaged 1.56.

The income multipliers were also estimated for the sampling of six Census Divisions across Alberta. The average local income multipliers across all six Census Divisions ranged from a high of 2.39 in the >550 sow equivalent category, to a low of 2.08 in the 250-550 sow equivalent category. The provincial income multiplier averaged 2.8 for the six sample Census Divisions.

Respondent Development Plans: One-half of the respondents indicated intentions of expanding their hog operations in the near future, specifically: 32% planned expansions within the next year; 64% within the next five years; 4% after five years; and 59% of the expansions were expected to greater than double their current production base.

Environmental Practices: Producers provided their perspective of the level of importance and degree of concern to their business for four factors. The greatest concern was placed on degree to which provincial/municipal regulations impact production/ expansion plans (3.36 out of 5), followed by degree of community support for their business endeavours (3.29 out of 5). They had the least amount of concern that their operation would have difficulty conforming to the standard Code of Practice (1.68 out

of 5).

Respondents were also asked to rate factors/practices important to their success of controlling odour in and around the barns, in and around the manure storage facility, and while applying manure.

Practices relative to barn location (distance to the nearest neighbour, setback and shelter), and barn design (manure handling and ventilation) were reported as having the greatest importance relative to control of barn odour, 3.67 and 3.5 on a scale of 5 in importance, respectively. Dust control practices and manure removal frequency were not viewed as being as important to odour control.

Factors viewed to be of greatest importance to success in controlling odour from manure storage were the storage location (3.7 out of a scale of 5), and the setback requirements, aeration, and manure treatment (each rated 3.6 out 5 in importance).The maximum storage time was also viewed as being important to odour control (3.4 out of 5).

Having the appropriate land base, and the proper incorporation method were viewed as being the most important to successful odour control during land application; 4.2 and 4 out of a scale of 5, respectively. Spreading near areas containing standing water, wells or springs were also of importance (3.8 out of 5). The type of spreading equipment used as well as the weather conditions at time of spreading were considered relatively less important to controlling odour during application.

Other factors considered important to success and identified as good stewardship practices were farm appearance, proper dead animal disposal, rodent and fly control, and responsible use/disposal of pesticides.

Community Relations: Respondents rated the presence of existing services in the community that can provide viable support for their family needs as the most important community relations factor to the success of their business. Agriculture being the main economic base of their community was secondary.

Respondents were also asked to rate the importance of a series of socio-economic factors to their quality of life. The socio-economic factors ranked the highest in importance included community group and/or service clubs (4.58 out of 5), availability of basic services such as grocery stores (4.1 out of 5), and health care facilities (4.06).

Many respondents emphasized the importance of developing a relationship between themselves and their neighbours with approaches including:

- meeting with all of the neighbours to let them know about any changes or future plans;
- inviting neighbours to tour the farm to see the buildings, to observe first hand the day to day operations of a livestock production facility, and to interact with the residents; and,
- presenting information about the hog operation to the community.

Thirty-one of the respondents indicated that they encourage community activities on their farm, such as sponsorship or goodwill, farm tours, etc.

Application of Study Results: On-going Operations: An economic base model was developed and applied to a 316-sow equivalents, and a 1,000-sow equivalent on-going operation. The magnitude of regional impact of hog production activities for the average size of the survey sample (316 sow equivalents) is expected to range from $1.3 million to $1.5 million and provincial impact of between $1.6 and $1.8 million per year. As a result of production expend-itures, the impact to the local economy of

operations with an average of 1,000 sow equivalents, is estimated between $3.5 million to $3.8 million each year. Provincial economic impact is estimated to be in magnitude of between $3.9 million and $4.4 million.

Development Impacts: Information relative to replacement value of assets was also gathered through the surveys. Based on a construction multiplier estimated by Alberta Treasury, the development costs of a 1,000-sow equivalents operation is estimated at $4.3 million (not including breeding stock). It was estimated by the respondents that approximately 79% of the total capital cost could be purchased within the region (50 km radius).

Phase II – Socio-Economic Impact

Economic Impact Of Case Studies:

1. Construction Phase: The construction phase for hog expansion or investment projects typically spans five to seven months, depending on the size of the project. With case study capital costs ranging from $570,000 to $4.8 million, GDP increased proportionately (ranging from $368,349 to $3.1 million). Labour income increases from construction ranged from $277,687 to $2.4 million. Employment also reflected capital costs with person years (PY) ranging from six PY on the smallest project to 51 PY on the largest expansion.
2. Ongoing Operations: The total economic benefit generated by expansion and investment in the Case Study examples ranged from $500,000 to over $5.2 million, depending on the proximity of the hog operation to the nearest community, the amount of economic activity generated by the operation, and linkages to other businesses in the community. With the exception of one case study, most of the economic benefits generated by the projects (over 90%) were anticipated to remain within the region (50 km).

Issues Facing the Developer: Issues faced by the new or expanding hog operations included:

- development approval processes;
- prohibitive water license costs;
- uncertainty relative to community receptive-ness;
- heightened environmental concern and pre-valence of media controversy; and,
- Code of Practice implications.

Measures to Alleviate Concerns: Case study participants were proactively taking measures to alleviate anticipated concerns relative to their expansion or investment projects. Some of these measures included:

- enhanced manure storage;
- investment in manure application technology;
- improved neighbour and community relations;
- soil and water testing processes established;
- site selection and design considerations;
- early application for water licensing; and,
- securing adjacent property.

Neighbourhood Reaction

Neighbour Familiarity With Expansion Projects: Seventy-three neighbours were surveyed and asked to rate several factors relating to their familiarity of the nearby hog operation (case study) on a scale of 1 to 5. Interviewees reported a familiarity with the case studies with a rating of 3.14 out of a scale of 5. Those owning property within the immediate area (1.6 km diameter around case study site) were slightly more familiar with the hog operation (3.27 for immediate neighbours versus 2.97 for those located an additional 2.4 kms around the case study site).

On average, the case study operators were perceived to be good stewards of the land and animal resources (4.05). The hog operators of the case studies were also cited as demonstrating good neighbour relations and support for their community (4.02 on a scale of 5 for support).

Importance of Socio-Economic Factors: Neighbours suggested that overall, socio-economic factors associated with health and safety, education, and property values were considered more important than those which impact housing, municipal services, recreation, and lifestyle.

More specifically, the top five socio-economic factors rated as most important to survey participants' quality of life were identified as, in order of importance; water quality, healthcare facilities and basic medical care, soil contamination/erosion, education programs/facilities, and availability of basic services such as groceries. Little, if any, differences were detected in responses between the immediate and surrounding neighbours.

The degree of influence by the case study on the socio-economic factors was perceived to be minimal, ranging from a low of 1.25 for arts/culture factor to a high of 2.05 for odour (on a scale of 5).

Factors Contributing to Concerns: The factors identified by neighbours as contributing the greatest concern with the existing nearby livestock operation (on a scale of 5) were manure disposal impact on odour (2.1), manure application method on soil erosion and contamination (2.03), wind direction impact on odour (1.92), leaching and runoff impact on water quality (1.89), groundwater and distance from surface water impact on water quality (1.88 each), available land for spreading manure impact on soil contamination (1.83), use of growth promoters and antibiotics impact on animal health (1.81), and low public confidence due to media impact on neighbour relations (1.74). Factors contributing to noise and dust were rated relatively low as to degree of concern.

In general, the degree of concern relative to contributing factors rose in relation to the proposed expansion site versus the current facilities. For the proposed site, the order of ranking relative to degree of concern changed. Of greatest concern were the application methods for manure disposal, availability of land, groundwater quality, wind direction, manure storage systems, leaching and runoff, distance from surface water, climatic conditions, ammonia emissions, and buffer zones and setbacks.

Instances of High Concern: Instances of high concern were very infrequent. Of some 3,500 responses, only 18 instances of high concern were identified: 11 related to odour, 6 pertained to water quality, and 1 related to traffic.

Odour: Odour quality was ranked -9.37 on a hedonic tone, versus an acceptable level of 4.5 and was characterized by interviewees as nauseating, rank, obnoxious, and foul. Odour was attributed mostly to manure spreading. The intensity was rated 2.33 on a scale of 0 to 3, with the most common duration reported to be 12 to 24 hours. Suggested corrective actions included use of odour reducing technologies, and ensuring adequate pit capacity and appropriate site spreading selection.

Water Quality: The overall nature of concerns relative to water quality were groundwater quality, water availability and acquifer vulnerability, groundwater supply, and surface water quality. The suspected cause of the problem was attributed to land application of manure, storage systems used for manure, and dead animal disposal methods.

Traffic: There was one instance of a traffic concern expressed which focused on damage to roads and danger to children on the roadway.

Neighbourhood Benefits: Benefits such as enhancing the economic base and promoting economic development of the community were deemed more important than those related to population increase, taxes, or the impact that intensive livestock operations have on uniform product quality.

Focus Group Feedback

Community Receptiveness: In the process of conducting five community focus groups, common themes emerged relative to the perceived importance of agriculture to the community and general receptiveness to intensive livestock projects, including:

- agriculture plays an important role in the economic and social base of the community;
- there has been significant changes in agriculture in the previous five years (size, number, focus of farms);
- taxes and revenue demands are influencing the selection and support of development projects;
- intensive livestock operators and families are spending locally; and,
- intensive hog production is perceived to be the worst environmental offender of intensive livestock operations.

Several positive effects were attributed to intensive livestock expansion, including:

- significant economic benefit;
- increased jobs and youth employment opportunities;
- community stability;
- infrastructure development; and,
- several value-added opportunities.

Conversely, several negative effects were attributed to intensive livestock expansion, including:

- odour, water quality/availability, soil concerns;
- negative infrastructure impacts;
- lack of provincial environmental standards;
- equalization of tax revenues; and,
- negative media surrounding the facts regarding intensive livestock operations.

Components for Environmental Planning: Community members provided the following suggestions for incorporation into developers' plans:

- focus on neighbour/community relations;
- increase public awareness; and,
- design and demonstrate an environmental management plan.

Development of an Operator Package to Assist in the Expansion Process

This report includes a description of the information required for the development of an owner/operator package to assist in the expansion process. It suggests questions that must be answered with the goal of demonstrating how sound management of an intensive livestock operation can help promote, protect, and improve environmental quality.

Knowing and understanding the legislation pertaining to hog production and comprehending the develop-ment steps will help owner/operators navigate the municipal approval process. Finally, encouraging community participation in development plans will assist in building harmony amongst all stakeholders.

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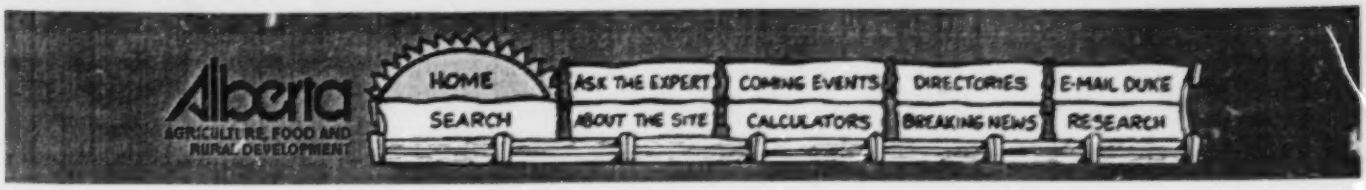

Introduction

Socio-Economic Impact Of Hog Operations In Alberta

[How Important is the Alberta Pork Industry | What Does The Future Hold? | What Are The Current Impediments To Success?]

1.1 How Important Is The Alberta Pork Industry?

The Alberta pork industry has more than doubled in terms of hog numbers since 1976, with a growth rate of over 4.2% per year. Alberta is the third largest among Canadian provinces in terms of hog numbers. Alberta produced 1.87 million head in 1986, and over 2.77 million head in 1996. Hogs slaughtered in the Alberta in 1997 were estimated at over 2.5 million head, nearly 16.5% of Canadian production.

Expansion in hog production is forecast to continue. According to the latest Statistic Canada figures for April 1st, 1998, 'Hogs & Pigs On Farms', Canadian total hog numbers were up 2.3% over last year, with breeding herd numbers up 5.7%. Saskatchewan is leading the charge in expansion with total hog numbers up 10.9% and female breeding stock up 12.7% over last year. Increases in female breeding numbers of 6.8% were reported for Ontario and Manitoba, 5.3% in B.C., 4.3% in Quebec and 3.2% in Alberta. Farrowing intentions for April-June are also predicted to by up 3% nationally, up 8% in Saskatchewan and B.C. and 4% in Alberta.

Approximately 3,000 hog farms are in business today in Alberta, down from over an estimated 26,000 in 1971. Farms have grown in size – over 85% of the hogs are grown on farms producing 500 or more hogs per year while almost half are grown on farms producing 2,500 or more hogs per year. These operations, which are often very technically sophisticated, are still predominantly individual family farms. There is a continuing trend of fewer and larger farms in Alberta, the rest of Canada and the U.S. Alberta Agriculture, Food and Rural Development (AAFRD) surveys have found that about 25% of pigs sold for slaughter were also traded or sold previously as weaners or feeders.

The economic impact of the industry on rural Alberta is immense. Farm receipts from hogs place the sector in approximately fifth position among all farm commodities. Annual farm sales have exceeded an estimated $461 million in 1996. The farm sale of hogs reflect an estimated annual increase of 8% since 1990. Alberta exports of pork and live hogs have risen over the past five to six years, particularly after 1994. Sales for export totalled almost $300 million in 1996, and of this amount about $72 million was for live hog exports to the U.S.

The pork industry benefits more than just farmers! Pork production means jobs and economic

opportunity for thousands of rural communities. The "value-added" nature of pork provides employment well beyond the farm. Hog enterprises provide employment for area residents, encourage diversification on farms in the immediate and near vicinity and contribute substantially to the local community. These benefits result from the spending made by the local enterprise as well as the re-spending of this income injection throughout the community.

1.2 What Does The Future Hold?

Restructuring and consolidation of the swine industry is occurring provincially, nationally and globally. Structural changes are necessitating reallocation of the productive capacity of the industry among regions. Alberta provides several advantages among provinces for production. It is strategically located with respect to a competitively priced feed source and is positioned logistically to capitalize on emerging Asian and other opportunities.

The global market offers tremendous growth potential for Alberta pork producers. Pork is the world's "meat of choice" by far, with approximately 43% share of the world's meat protein market. The Canadian pork industry is steadily increasing its share of this vast world market, exporting about 30% of its production in 1996. Alberta cost-efficient producers are poised to capture even more of the global pork business as trade barriers fall under terms of the NAFTA and GATT.

Alberta hog production is poised for mass expansion. Predictions of growth opportunities have targeted four million market hogs a year by 2000, and potentially up to eight million market hogs a year by 2005. Eminent expansion is witnessed by such announcements as:

- Saskatchewan Wheat Pool's construction plans for about 121,000-sow farrow-to-finish hog operations, including some in Alberta, and their purchase of shares in Fletcher's;
- Pig Improvement Canada's plans to build barns to house 4,000 to 5,000 sows in one location near Drumheller;
- Elite Swine's plans to build facilities to produce 6,000 sows;
- Alberta Pig Company's plans to build facilities for 3,000 sows or more in east-central Alberta; and,
- Puratone are considering 10,000 sows in Alberta by 2002. They already have 21,000 sows in Manitoba.

1.3 What Are The Current Impediments To Success?

One of the greatest impediments to pork expansion is the perception of the negative impact of hog production to the quality of life in rural communities. The main concern associated with large pig barns is that of odour, however citizens have also expressed concerns related to contamination of the ground water, spills and overflows from manure lagoons, competitions for available water supplies, increased traffic on roads and general nuisances from flies, dust etc.

Traditionally, pork producers considered odour an inherent part of livestock production. However, air

quality is an important component of producing pork in an environmentally responsible manner. Farm management and design decisions have an affect on air quality. Today, both rural and urban neighbours desire a living space free of animal manure odours.

A recently released report on agricultural impacts on water quality in Alberta raises questions about provincial plans to expand the number of livestock to 18 million by 2005 from a current high of nine million, and the ability of local governments to monitor industrial agriculture. The general findings of the report were that agricultural practices are contributing to water quality degradation – in surface and shallow groundwater. The good news is that deep groundwater is not affected.

There needs to be a balanced response to the environmental challenges facing Alberta's agri-food industry. Both the industry and government are actively addressing these challenges through the development of the following:

- education/technology transfer to change producer practices;
- research – to find new technologies and approaches;
- regulation – to deal with those that refuse to be responsible; and,
- monitoring – to indicate if progress is occurring over time.

Alberta Agriculture, Food and Rural Development (AAFRD) has identified three areas of emphasis essential for protecting the quality of drinking water including the improving of the core understanding through better assessment of the extent of water contamination, the managing of the problem through development of a range of technologies to detect agricultural chemicals and algae toxins and the prevention of the problem through improved guidelines and best management practices.

Codes of practice and regulatory requirements are currently being reviewed. Producers support the premise that such requirements must be environmentally protective and economically viable and encourage consistency between jurisdictions. It is suggested that they also provide for reasonable flexibility to accommodate local community needs and site specific conditions. In addition, producers must be informed as to know how to comply, regulators informed as to know how to enforce, and the public informed as to what to expect.

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The Need For An Economic Impact Assessment

Socio-Economic Impact Of Hog Operations In Alberta

[The Issues | The Solution – A Customized Community Specific Economic Impact Tool]

2.1 The Issues

- Little factual information exists to adequately evaluate the benefits of hog operations to local and regional rural communities.

How does this activity stimulate local businesses and contribute to the local economy? Will continued changes in agriculture affect rural communities? What are the estimated value of the benefits that will come from hog development and expansion activities?

Consolidation in agriculture and the growing dependence of farm households on non-farm income have weakened agriculture's tie to the rural economy. Once a primary driver of the rural economy, agriculture's impact on rural economic prosperity continues to diminish as consolidation and industrialization reduce agriculture's share of rural employment and income. Most rural communities developed out of a need to provide goods and services in support of primary production. However, throughout Alberta, communities are faced with job losses, out-migration, business failures, school closures and a diminished capacity to cope with economic problems.

Increasingly, local government decision-makers and citizens are recognizing the connection between agriculture production dollars and economic vitality of their local community. But both investment and spending create favourable economic ripple effects. What is required is a tool to aid in the evaluation of hog operations that can be customized for their community.

- Recent controversial publicity about water quality and environmental concerns related to the pork and other intensive livestock industry has lacked the perspective needed to make fact-based decisions about important industry issues.

Publicity has had a negative effect on many sound development projects. Much of this publicity has mischaracterized the pork industry as unregulated, unsustainable and uninterested in the proper natural resource management. The Alberta Pork Producers Development Corpora-tion (APPDC) believes that this misconception could not be further from reality. Neighbours and concerned citizens of hog operations need to learn about current hog production practices and what producers are doing to

eliminate or minimize any adverse effects on their surroundings.

The APPDC is committed to promoting environ-mentally sustainable practices in hog production by working with the industry and other stake-holder groups. Some activities of APPDC include:

1. *funding research and* technology develop-ment which target improved management practices to protect water quality. The APPDC Research Committee dedicates 20¢ per hog marketed in Alberta toward research support;
2. administration of the Canada/Alberta Hog Industry Development Fund which supports the research of environmental issues including manure/nutrient management, odour, and water quality; and,
3. a land use committee that focuses on issues relating to hog production impacts on the environment, including water quality; and,
4. working with partners such as:
    - AAFRD to address the critical areas of water quality and environment;
    - Alberta Agriculture Research Institute (AARI) on research in manure and environment management;
    - Agriculture and Agri-Food Canada (AAFC) and Prairie Farm Rehabilitation Administration (PFRA) on lagoon seepage research and load rates for manure application;
    - in co-operation with the Canadian Pork Council, AAFC has undertaken the Hog Environment Management Strategy (HEMS) across Canada. As the Alberta representative of the CPC, the APPDC hosted the first industry meeting in Alberta during December, 1997. This long-term initiative is exploring new technologies and opportunities to ensure hog production does not harm water quality in Canada;
    - membership on the Alberta Environ-mentally Sustainable Agriculture (AESA) Council;
    - support to University of Alberta for research. During 1997, the APPDC purchased an olfactometer. This instrument will be an important element in environmental studies relating to hog odours at the University of Alberta;
    - support to the University of Calgary for research specific to the prevalence and survival of bacteria and parasite pathogens in hog effluent;
    - support to Alberta Research Council for research, including the development of biofilters for the control of hog barn odour and air purification. At present, the APPDC, AAFRD, the University of Alberta, and ARC are working toward a "Mobile Nosemobile" which the ARC is developing. The olfactometer will be located at Vegreville and will be included in the mobile unit;
    - co-operation with the Lacombe Research Station;
    - general support to the Prairie Swine Centre Inc. which includes research targeting manure management and water quality; and,
    - co-operation with other intensive livestock groups in the formulation and development of the Alberta Livestock Council. This alliance has a mandate to develop an Alberta Rural Land Planning Strategy for livestock industry expansion supported by a regime of best manage-ment practices that focuses on environ-mental sustainability, global competitive-ness, and public acceptance. The Live-stock Council is developing a

compre-hensive producer information, communi-cations, and education program on manure/nutrient management.

All pork producers, regardless of size, have a responsibility to protect the environment. No direct correlation between the size of a pork production operation and its environmental impact has been clearly identified. Small, poorly located and poorly managed operations can have significant environmental effects while large, well located and properly managed operations can have negligible effects. New or expanded operations are most able to meet regulatory requirements through the prior planning and investment in the operations.

2.2 The Solution – A Customized Community Specific Economic Impact Tool

The social and economic implications of hog production can be assessed in a number of ways:

- An economic impact analysis to estimate the impact on income and employment within specific communities, regions, or the province as a whole; and,
- A social impact analysis to identify and assess demographic, local government and community concern.

A customized community fiscal/economic impact analysis will provide the hard data to show economic impact of on-going day-to-day hog operations and the benefit potential of any one or all of the development projects in progress. The tool is based on industry-specific economic multipliers customized for different types of rural communities. A comprehen-sive examination of the challenges and potentials of sustainable regional hog production requires appropriate information with regards to consumption patterns, production activities, and business relationships which exist within and between the regions.

Operations that obtain a large portion of their capital and operating inputs locally will have more of an affect on the local economy. Purchases require output from suppliers which, in turn, create jobs and income throughout the region and economy. The distribution of direct purchases is based on purchasing patterns.

The use of multipliers as predictive tools has been validated and documented. Multipliers are popular primarily because they can deal with "what if" questions. The economic multiplier, also known as the multiplier effect, is a measure of how much economic activity can be generated in a community by different combinations of purchasing and invest-ment. Benefits can be estimated based on the number of employees, the number of additional jobs that this spending supports and the income generated by the spending. For example, what happens in terms of local employment when a 600 sow farrow-to-finish operation is established?

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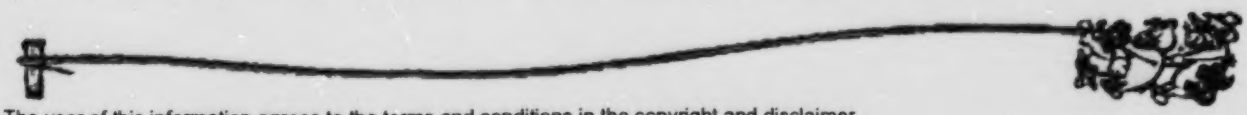

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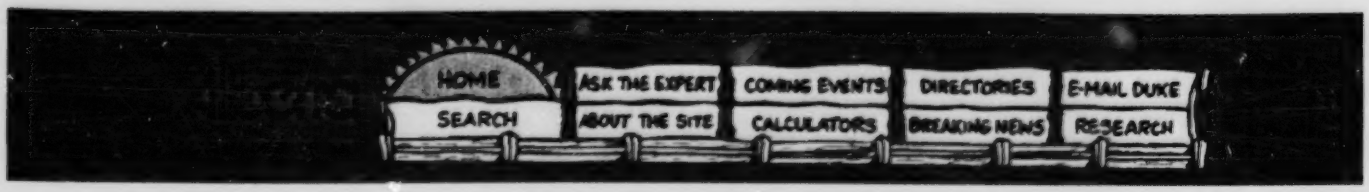


Study Design

Socio-Economic Impact Of Hog Operations In Alberta

[Theoretical Basis | Producer Survey | Key Factors | Multiplier Estimation]

3.1 Theoretical Basis

Economic impact analyses estimates the impact of economic decisions (i.e., expansion of hog operations) on the output of goods and services in an economy and on employment and personal income. It allows for an objective evaluation of the economic impact of a particular action or project on the local economy. The flow of goods and payments through an economy may be divided into two broad groups, basic and non-basic. The basic sector is made up of firms that sell goods and services to businesses and consumers outside the local economy. The sale of these goods and services bring new income into the local economy. Most agricultural businesses fall into this category. This new spending by businesses and consumers from the outside provides the base on which an economy can grow. Inflows include the sale, or export, of goods and services to outside entities, investment income from external sources, and payments received from outside. The non-basic sector is made up of firms that sell goods and services to local businesses and consumers. Dollars remain in the local economy. Such businesses as grocery store and service stations fall into this category. An economy can remain prosperous if the basic sector remains strong.

An economic impact analysis is based on the concept of the multiplier. The multiplier is a numeric value, greater than 1.0, representing the ratio of the total impact, or the sum of the direct, indirect and induced impacts, to the initial or direct impact. Impacts can be expressed in terms of direct, indirect and induced effects.

- Direct effects are production, income, employment, tax, resource or environmental changes associated with the immediate effects of a change to the total output of a basic industry of an economy;
- Indirect effects are production, income, employment, tax, resource or environmental changes in backward-linked industries (i.e., suppliers to the hog operations), caused by the changing needs of the hog operation, e.g., the additional purchases of inputs to produce more hogs; and,
- Induced effects are the changes in regional household spending patterns caused by changes in income generated from the economic activity of the hog operation.

The ultimate, total impact represents a multiple effect – the value of the multiplier – of the original output within the hog industry. For every dollar in initial expenditures, total expenditures throughout the

entire economy will increase by a larger amount. The more pervasive the linkages of the hog industry to other industries within the local economy, the greater this multiple effect. For example, an increase in the economic output of a hog operation (direct effect) would cause suppliers of such inputs as feed manufacturing, grain handling, veterinarians, trucking, equipment suppliers, etc. to increase their production (indirect effect). The direct and indirect effects on sales, employment, and income would cause household income and spending to increase in general, further stimulating the economy (induced effect).

The valuation of the hog industry to an economy should not be strictly based on the extensiveness of its ties to other industries (the size of the multiplier), but also on its effects to the economy's overall standard of living. Hence, the second phase of this analysis will focus on the community quality of life aspects.

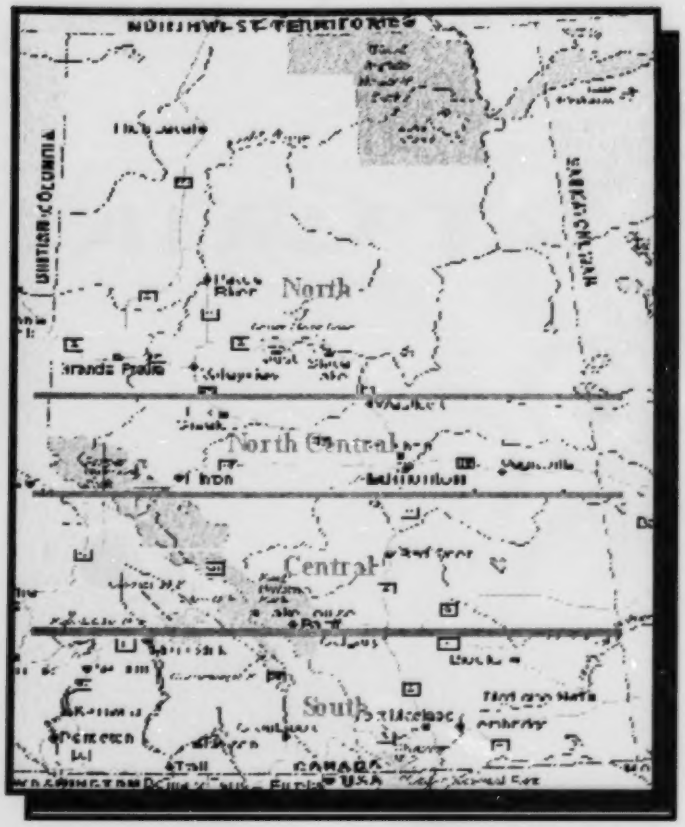
3.2 Producer Survey

In-person interviews were conducted with hog operations across Alberta to obtain detailed information relative to the current years operation and its employees, including:

- replacement value of capital assets and annual maintenance of facilities;
- annual inputs used, costs and purchasing patterns (purchases within 10 km, 50 km, greater than 50 km);
- number of employees, wages and hours of work; and,
- location of employee residences and their spending patterns (budget breakdown).

Candidates for interviews were selected from a random sample which was stratified by region, type of operation and size of operation based on a-priori data from APPDC. Figure 3.1 depicts the regional distribution of the sample, i.e., north, north central, central, and south. These regions were selected to proportionately represent the sample population.

Figure 3.1 View of Regions



In addition to the financial data gathered on site, producers responded to a series of environmental and community relationship questions. These questions were necessary to gain insight relative to current awareness of issues and concerns, level of management practices, and identification of key factors influencing quality of life within their communities.

For the purpose of this analysis, the expenditures reported by the hog operations were adjusted in order to account only for those items which were directly related to the existence of the operation. As a result, grains purchases were not included in the multiplier calculation. In the absence of the hog operation, it is reasonable to assume that the local barley would be sold. Barley producers may experience indirect benefits arising from the sale of their product to the hog operation. These may include, but are not limited to, providing a local alternative market, price stability, cash flow, and the potential for contracting which may create a more reliable market overall.

3.3 Key Factors

The analysis of economic impact hinges on three key factors:

- the proximity of the hog operation to the nearest community;
- the amount of economic activity generated by the hog operations; and,
- the linkages between the hog operations with other industrial businesses in the community.

The last factor is directly related to the type of trading centre within which the community resides. All urban centres can be classified into categories based on the characteristics of the community. The characteristics of population size, number and array of businesses, and accessibility may be applied to categorize centres into six functional classifications. Minimum Convenience Centres (MCC's) are the smallest and functionally simplest centres, generally providing only the most basic of services such as groceries and gasoline. Full Convenience Centres (FCC's) are the next simplest type of centre and provide the same complement of services as MCCs, plus some activities that require more population such as implement dealerships and general merchandise. With each subsequent type of centre (Partial Shopping Centres (PSCs), Complete Shopping Centres (CSCs), Secondary Wholesale Retail Centres (SWRCs) and Primary Wholesale Retail Centres (PWRCs)), the complement of business services, population and personal income rise to the largest functional centre category of Primary Wholesale Retail Centres such as Edmonton, Calgary, and Red Deer.

3.4 Multiplier Estimation

Multipliers are used to estimate the effects on an economy resulting from changes in final demand (increased sales), or changes in output (increased productive capacity). They are derived from detailed and comprehensive assessments of a specific activity (hog production). This study develops two types of economic multipliers to estimate economic impacts: employment multipliers to estimate effects on employment from production, and income multipliers to estimate effects on the economy's total income that is generated from production.

Employment multipliers are used to estimate the number of full-time equivalent jobs generated by a hog operation. Employees generally take up residence near their place of employment and spend some portion of their income in the local community. This spending in turn supports the employment of other people in the community. This may be expressed as a ratio of non-basic employment to total employment for each Census Division in the province and is representative of the subsequent round spending (calculated as 1/ (1-non-basic employment/ total employment)). Statistics from the 1991 Statistics Canada Census were used for the calculations as the required data from the 1996 Census is not scheduled for release publicly until June of 1998.

The income multiplier contains two components: a wage and expenditure component. The calculation may be represented as follows:

$Y = Y_W + Y_{EX}$
$Y_W = [(1 - M_2 + M_{1W}) / (1 - M_2)]$ x Wages
$Y_{EX} = [(1 - M_2 + M_{1EX}) / (1 - M_2)]$ x Expenditures

Where:

Y is the total income impact on the local community;
Y_W is the total wage component of the income multiplier impact on the local community;
Y_{EX} is the total expenditure component of the income multiplier impact on the local community;
M_2 is the ratio of non-basic employment to total employment by Census Division and is representative of subsequent round spending in the local economy. This figure provides an indication of the proportion of each dollar of consumption that is paid to the local factors of production;

M_{1W} is the proportion of wages spent locally based on the functional classification of the nearest town; and,
M_{1EX} is the proportion of hog production inputs purchased within a 50 km radius of the operation.

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Study Findings

Socio-Economic Impact Of Hog Operations In Alberta

[Survey Response | Respondent Activities | Generated Multipliers | Respondent Development Plans | Environmental Practices | Community Relations]

4.1 Survey Response

Forty-four (44) interviews were conducted, of which forty-two included complete financial detail of value to the economic analysis. The sample is believed to be representative of the target population based on a-priori information from APPDC. The following graphs reflect the sample demographics by enterprise type, size of operation and regional distribution. Approximately 77% of the sample (including six Hutterite entities), were farrow-to finish operations, 16% finishing and 7% were farrow-wean (Figure 4.1). The target size (APPDC data) of the categories is illustrated in Figure 4.2. The actual sample did contain a greater concentration of larger operations (43% vs 30% in the >250 sow equivalent category). However, the exclusion of the Hutterite colonies from the analysis results in a remaining sample more reflective of the target size distribution. For reporting purposes, the largest size category (>250 sow equivalents) was subsequently divided into two groups: those with 250 to 550 sow equivalents, and those with greater than 550 sow equivalents. This subsequent breakdown allows for greater information discovery relative to the impact of larger size operations. As illustrated in Figure 3.1, the boundaries for the regional split of the total provincial territory were initially set to include four geographic areas:

- South: area south of Calgary;
- Central: Calgary to Wetaskiwin;
- North Central: Wetaskiwin to North Edmonton; and,
- North: Peace River area – subsequently combined with the North Central area and termed "North".

Figure 4.1 Types of Operations

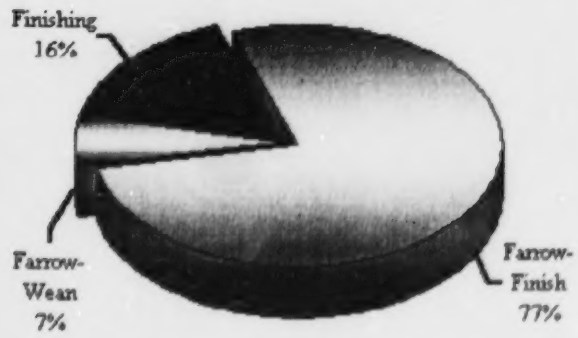


Figure 4.2 Targeted Size of Operations
(Sow Equivalents)

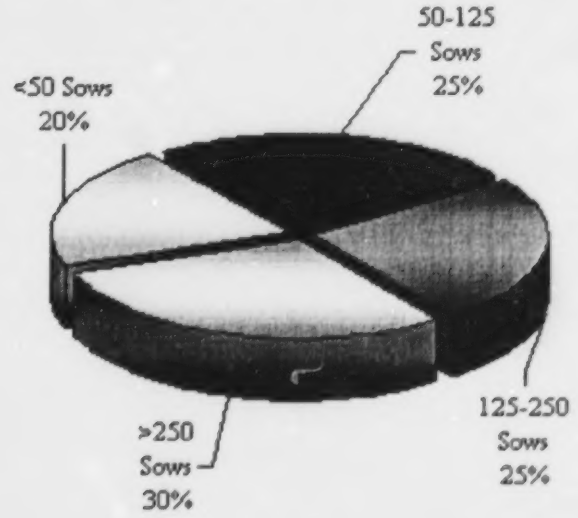


Figure 4.3 Actual Size of Operations
(Sow Equivalents)

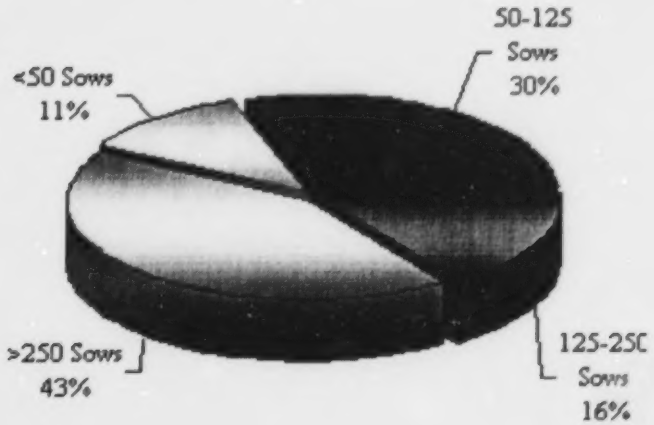


Figure 4.4 Targeted Regional Distribution of Sample

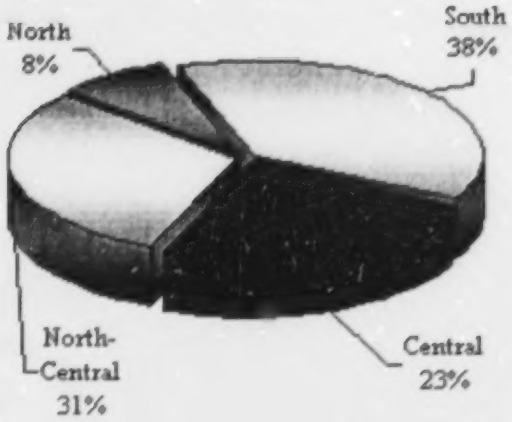
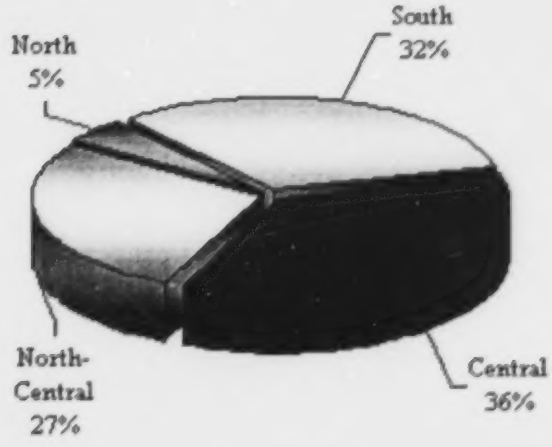


Figure 4.4 illustrates the percentage of the operations targeted in each region. Figure 4.5 shows the actual regional distribution of the sample. Due to the small number of responses from the North region, the North Central and North regions were combined for reporting purposes.

Figure 4.5
Actual Regional Distribution of Sample



4.2 Respondent Activities

Pork production combines many inputs including labour into a complex process of converting feedgrains, high-protein feed ingredients, vitamins, minerals and water into live hogs and eventually pork and pork products. Detailed information relative to spending patterns, labour, feed, other variable costs, fixed costs, and capital costs was obtained from the participants in the survey. Spending patterns and usages are key information driving both the employ-ment and income multipliers. The findings are herein presented.

4.2.1 Spending and Labour Patterns

Operator and Employee Spending Patterns: The following Figures 4.6 and 4.7 depict the typical budgetary spending patterns of both the owner/ operator and employees of hog operations. Within the employee budget, the greatest component was spent on food and clothing (25%) and vehicle expenses (23%). Rent and mortgage comprised 13% of the budget, followed by expenditures such as recreational and home improvement expenses (9%), savings (7%), banking (6%), and medical/dental expenses (6%). Utilities and expenses for school, church and postal comprised 4% each. Owner/operators tended to spend a greater proportion of their budget on food and clothing (32%), recreational and home improvements (10%), banking (12%) and school and church and postal (9%).

Figure 4.6 Employee Spending Patterns

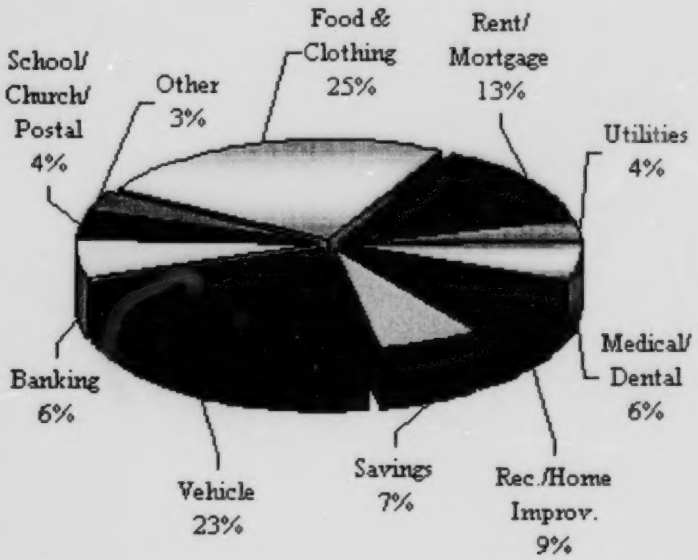
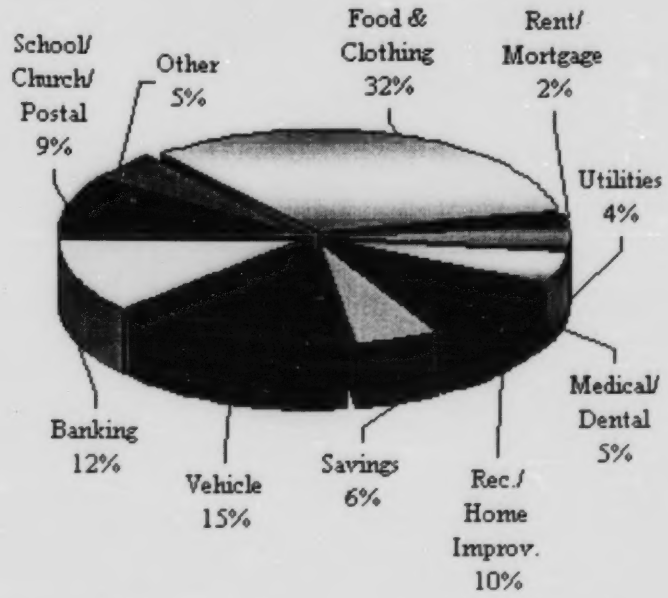


Figure 4.7 Operator Spending Patterns



Both the employee and operator spend greater than 80% of their budget within a 50 kilometre radius of their place of employment (Figures 4.8 and 4.9), 85% and 81%, respectively. The employees reported spending approximately 46% of their budget within the local 10 kilometre radius, whereas, operators spent approximately 33% of their budgets within the same locality.

Figure 4.8 Area of Spending – Employee

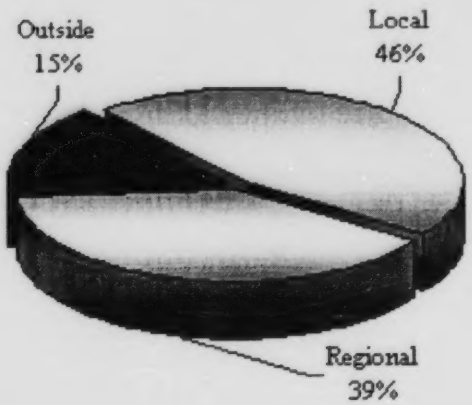
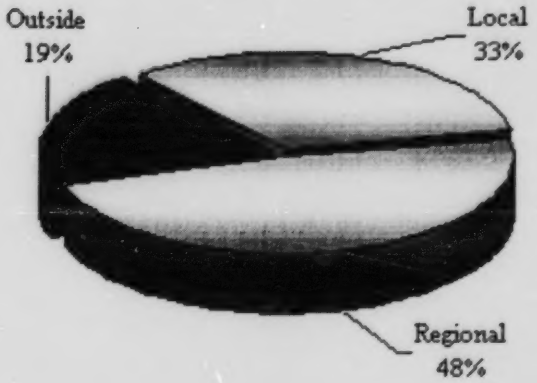


Figure 4.9 Area of Spending – Operator



An assessment of the spending patterns by functional type of trading centre confirms that as the size of a centre increases, so too does the range of its activities. (See Section 3.3 for a description of the six functional classifications.) The shopping patterns of paid employees of the surveyed hog operations are reported in Table 4.1 and reflect the following pattern relative to functional centre classification:

Table 4.1 Shopping Patterns of Paid Employees by Functional Classification of Centre

	% Local (<10 km)	% Regional (10-50 km)	% Other Provincial
Minimum Convenience Centre	5.0	62.9	32.1
Full Convenience Centre	50.4	20.3	29.3
Partial Shopping Centre	84.6	13.9	1.5
Complete Shopping Centre	90.5	4.0	5.5
Secondary/Primary Wholesale-Retail	96.5	2.20	1.3

Those located close to a secondary/primary wholesale-retail area do the bulk of their spending locally (96.5%), due to the full complement of services. Those located near Minimum Convenience Centres (MCC's) purchase very little locally (5%) as MCC's generally provide only the most basic of services, e.g., groceries and gasoline. Smaller centres are often bypassed for larger centres which offer a full complement of services.

Labour:

The average number of paid full-time labour equivalents for the entire sample was estimated to be 2.44. This included all paid labour for operator, full-time employees, part-time employees and any paid family labour. The average number of full time equivalents (FTE's) ranged from .208 for the smallest size operations to a high of 5.1 for those operations in the >550 sow equivalent category (Figure 4.10). Note that the >250 sow equivalent category has been further segregated into 250-550 and >550 sow equivalents in order to deliver a better presentation of the data and representation of the sample. These five size categories will remain in place for the balance of the report. In addition, approximately 2,795 hours of unpaid operator labour and 246 hours of unpaid family labour were required on the average farm.

The average wages reported for full-time equivalent paid labour (under the assumption of 2400 hour/year) was approximately $35,256. This average ranged from a low of $28,800 per FTE for the smallest size category to a high of $36,454 per FTE for the size category of 50 to 125 sow equivalents

(Figure 4.11).

Figure 4.10 Average Number of Paid Full-Time Equivalents for the Average and by Size Category

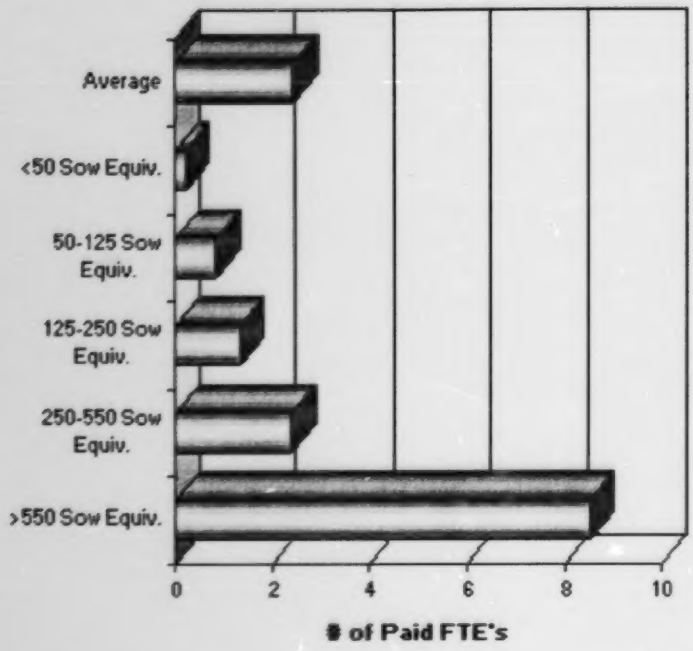
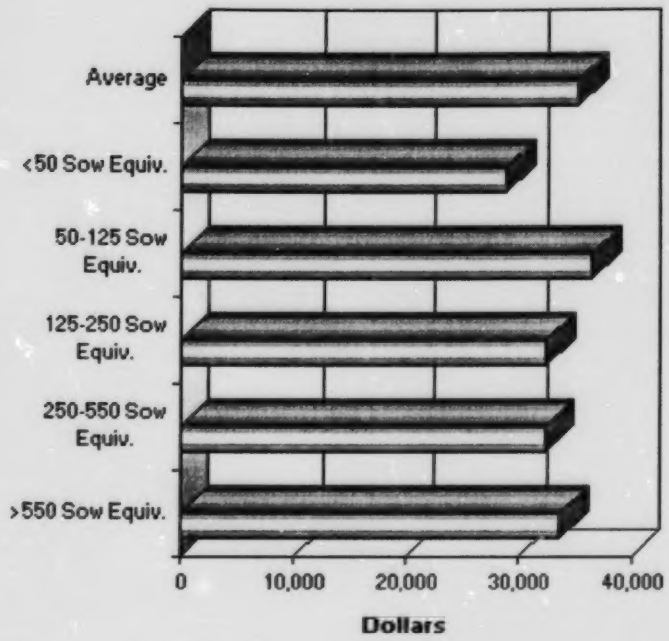


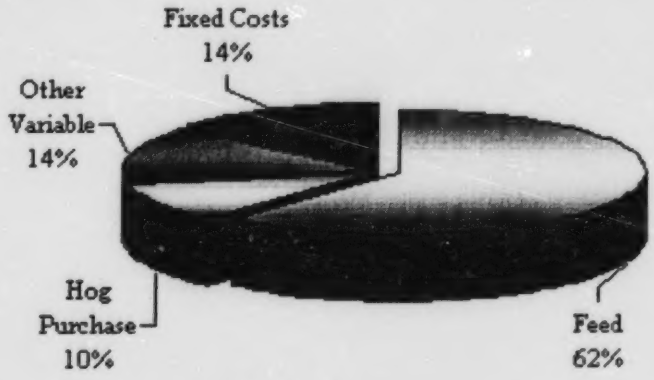
Figure 4.11 Average Salary Per Full-Time Equivalent For Paid Labour



4.2.2 Feed and Other Variable Expenditure Patterns

Feed:
Feed is the major production input to the pork production process. In fact, feed accounted for approximately 61.7% of all production expenses. Of the total feed expense, 33.7% was spent locally, 35.6% within the 50 km radius, and 29.4% outside the 50 km radius. Figure 4.12 breaks down the expenditures of the survey sample.

Figure 4.12 Expenditures of Survey Sample



Figures 4.13 through 4.16, inclusive, illustrate feed costs by region, type of enterprise and size category

for the total survey sample as well as for the sample not including Hutterite operations. Results excluding Hutterite responses are provided in order to assess the degree of differences in spending patterns. The differences are detected primarily in the South region and the 250 to 550 sow equivalents categories. Note that North Central and North regions initially described were subsequently combined and termed "North" in the following graphs.

Figure 4.13 shows that, on average, approximately 70% of the feed used by hog operations was purchased within the 50 km radius (72% of feed not including Hutterite entities). The amount spent within the 50 km radius ranged from a high of 75% in the Central region of Alberta to a low of 56% in the North region. South region respondents purchased over 67% of their feed regionally.

Figure 4.13 Feed Cost by Region for the Total Sample

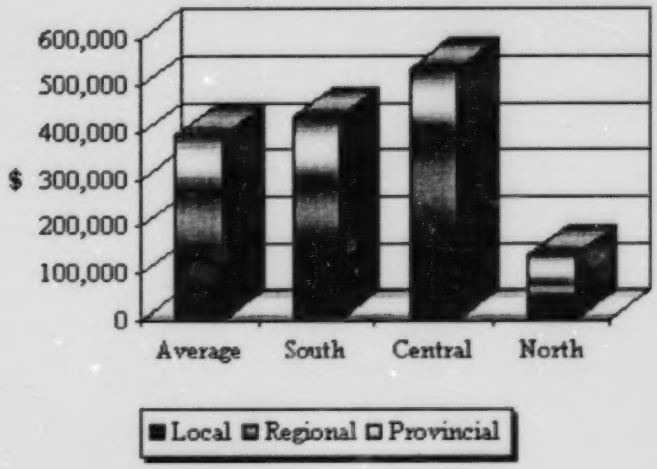


Figure 4.14 Feed Cost by Region, Excluding Hutterite Entities

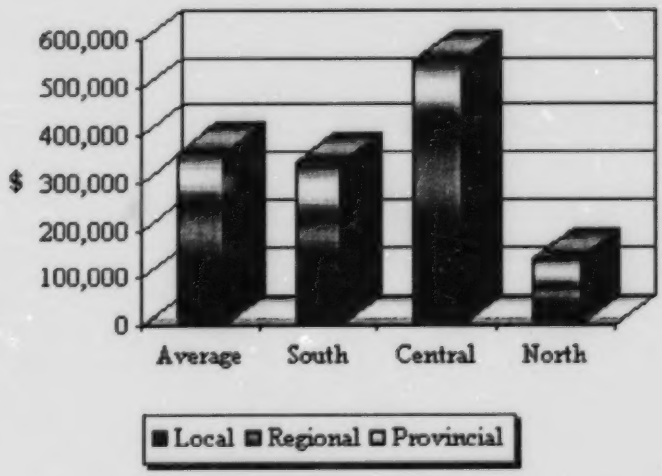


Figure 4.15 Feed Cost by Size Class for Total Sample

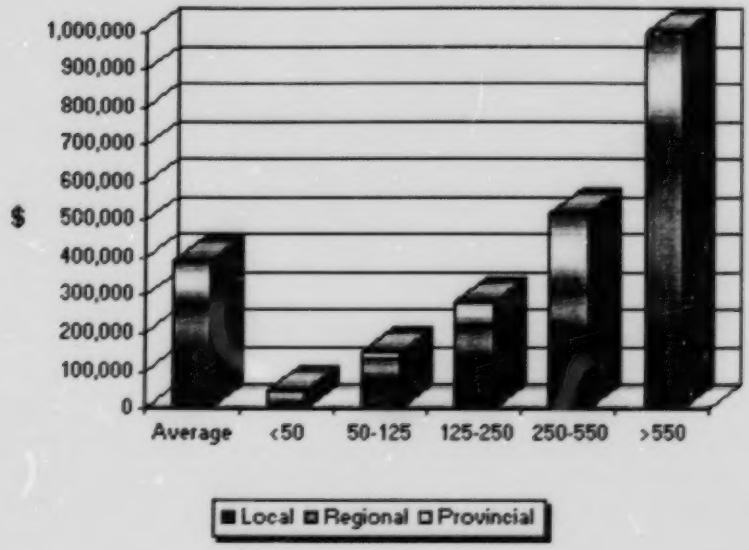
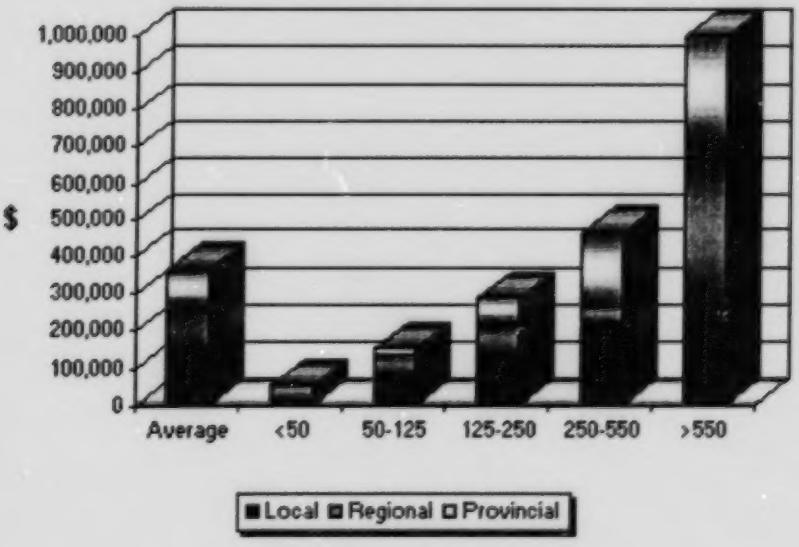


Figure 4.15 illustrates feed purchase patterns by size category. Smaller size operations purchase a greater proportion of their feed within 50 kms (99% for operations with less than 50 sow equivalents and 91% for 50 to 125 sow equivalents). Operations in the 125 to 250 sow equivalent size purchased approximately 78% of their feed needs within the 50 km radius, while those operations in the 250 to 550 sow equivalent category and greater than 550 sow equivalents purchased 60% and 72% of their feed needs within the region.

Figure 4.16 Feed Costs by Size Class, Excluding Hutterite Entities



Figures 4.17 through 4.20 illustrate spending patterns for feed costs by type of operation and average spending patterns for feed costs – with and without grain.

Figure 4.17 Spending Patterns for Feed Costs by Type of Enterprise

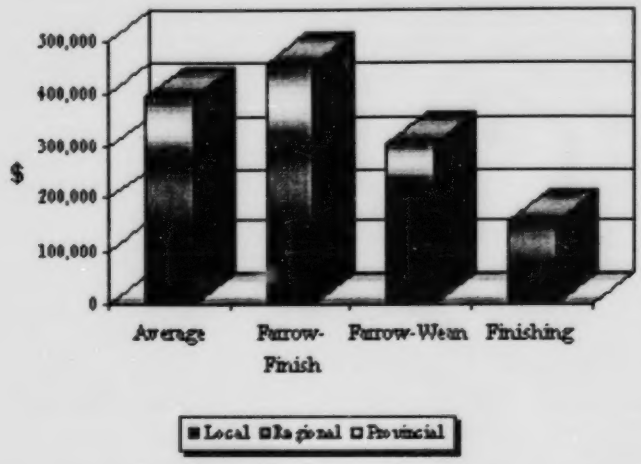


Figure 4.18 Spending Patterns for Feed Costs by Type of Enterprise, Excluding Hutterite Entities

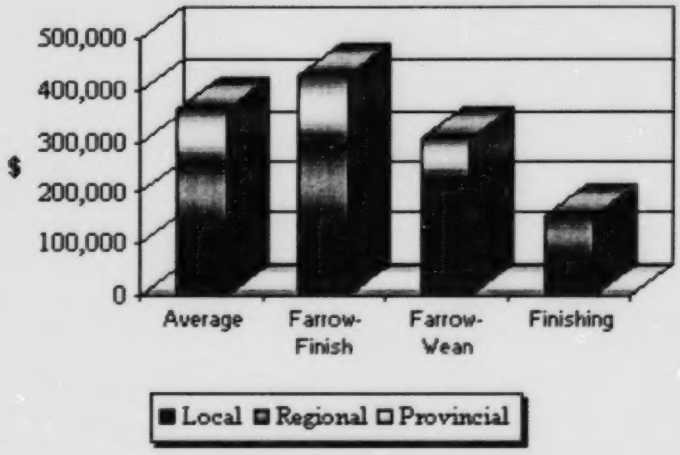


Figure 4.19 Average Spending Patterns for Feed Costs – With and Without Grain

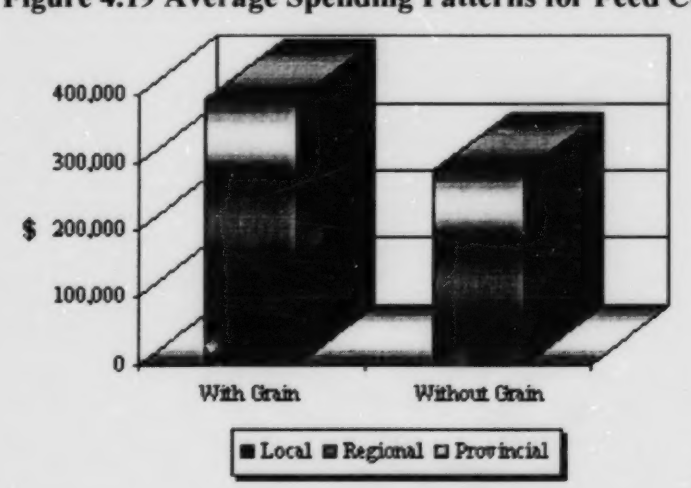
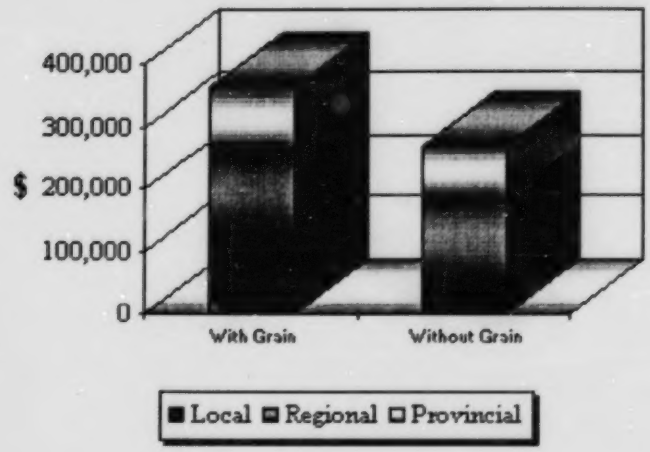


Figure 4.20 Average Spending Patterns for Feed Costs – With and Without Grain, Excluding Hutterite Entities



Other Variable Expenses:
Hog purchases, breeding animals and weaner and feeder pigs, comprised 10% of total production expense (including feed and labour) and other variable costs comprised 14% (Figure 4.21). Expenses included in the other variable cost category are hog purchases (42%), bedding, genetic and veterinarian expense, trucking and marketing, repairs and maintenance, manure disposal, custom work, utilities and other variable expenses. Feed expenses and labour costs are excluded from this illustration and are analyzed separately.

Figure 4.21 Variable Costs Not Including Feed or Labour Expenses

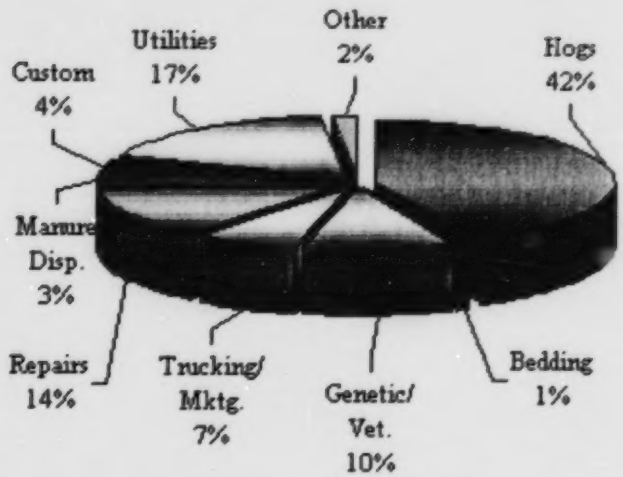
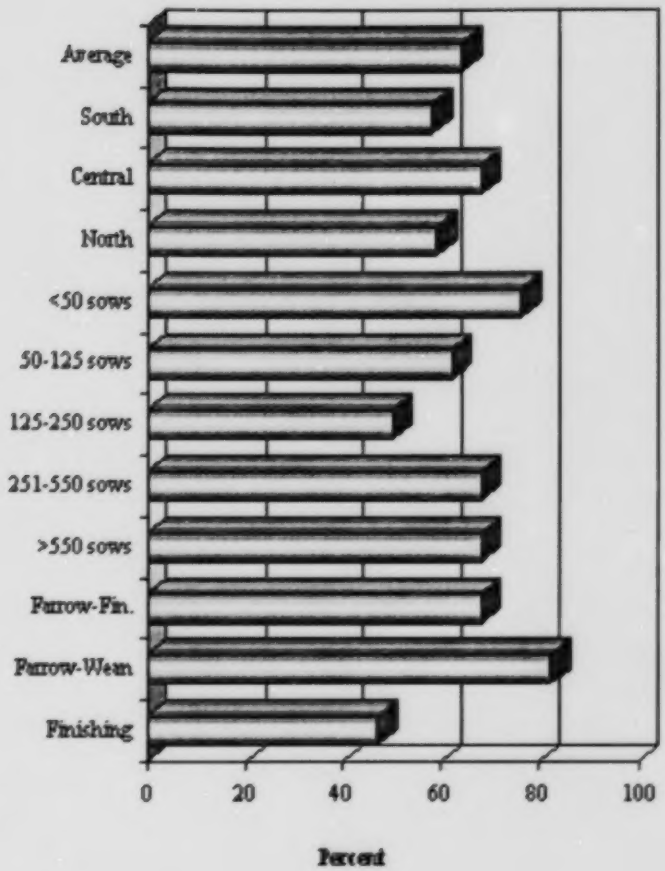


Figure 4.22 illustrates that for an average expense of over $157,099 on variable costs, not including feed or labour, approximately 64% was spent within the region. This proportion ranged from 58% and 59% in the South and North regions, respectively, to 68% in the Central region. No direct correlation between

proportion of variable costs purchased regionally and size of operation was evident. Farrow-wean operations purchased approximately 82% of their variable needs regionally, the greatest proportion being attributed to hog purchases. Finishing operations purchased only 47% of their variable needs regionally.

Figure 4.22 Proportion of Variable Cost Purchased Regionally

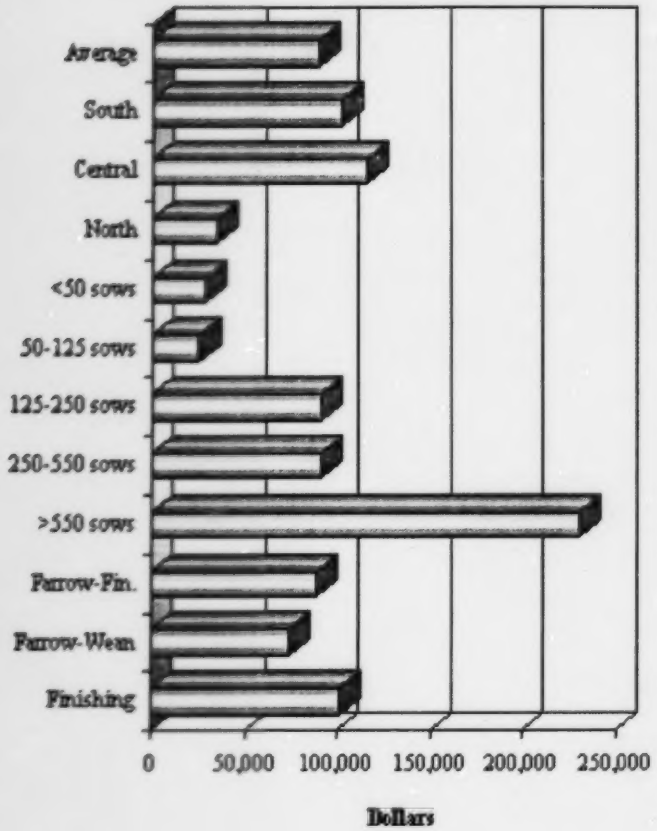


Fixed Expenses:

Fixed expenses included such costs as miscellaneous barn expenses, banking, depreciation, property taxes and insurance, office and administration and other related fixed costs. Figure 4.23 illustrates that for the sample, the average fixed costs were reported to be approximately $89,500 of which 93% was spent regionally. Figure 4.24 reports the proportion of fixed expenses spent regionally. Within the size categories, the lowest fixed expenses where reported by smallest enterprises, less than 50 sow equivalents ($28,124) and increased to a high of $230,788 reported by those operations in the 250 to 550 sow equivalent size category. Insurance was cited as the greatest expense incurred by the smallest size category. Insurance was purchased outside the 50 km radius, thus attributing to only 25% of spending within the region (see Figure 4.24, <50 sow equivalents). Fixed costs ranged from a low of $33,985 in the North region to a high of $115,293 in the Central region. Farrow-wean operations reported an average fixed cost of $73,730, of which 97% was spent regionally. Farrow-finish operators reported

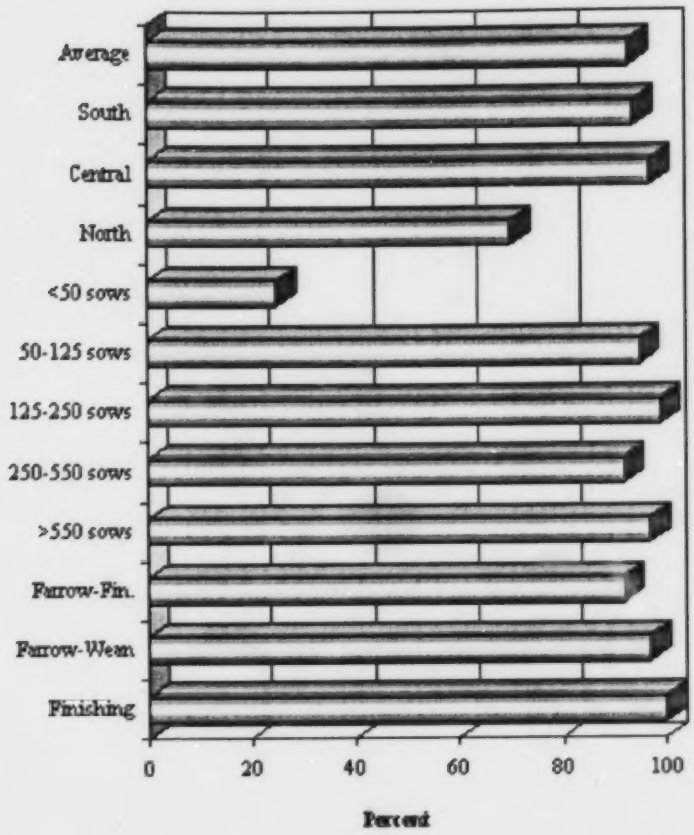
fixed expenses in the magnitude of $88,558, 92% of which was spent within the region. Finishing operations reported fixed expenses of $100,565, all occurring within the region.

Figure 4.23 Fixed Expenses by Region, Size Class, and Enterprise Type
(Sow Equivalents)



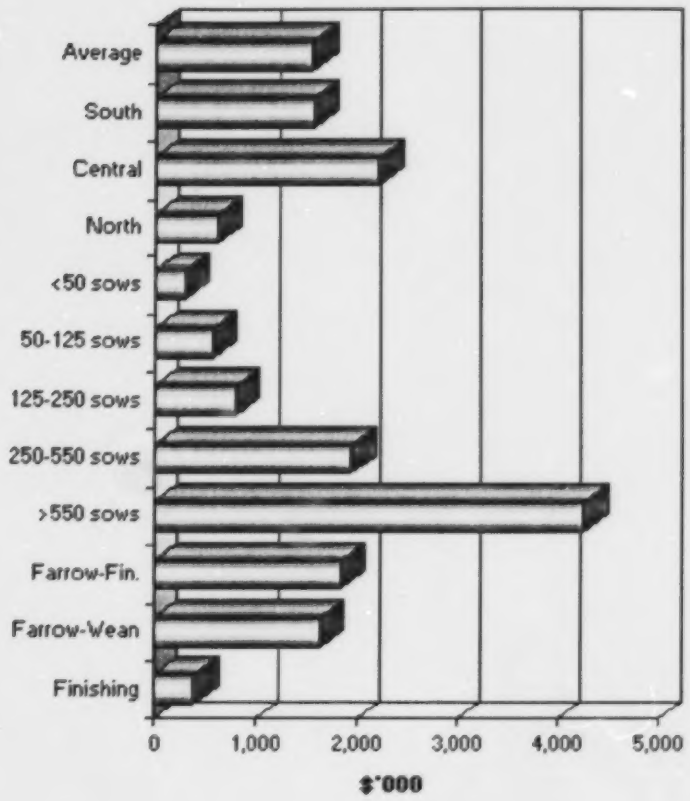
With the removal of the Hutterite entities from the sample, the average fixed cost becomes $96,534 with 93% spent regionally. The South and Central regions experience comparable increases in average fixed costs to $114,291 and $130,565, respectively. The category marketing 250 to 550 sow equivalents experiences a significant increase in fixed costs to a total of $134,004, of which 91% is spent regionally. Farrow-finish averages for fixed costs also rise to $98,080.

Figure 4.24 Proportion of Fixed Expenses Spent Regionally
(Sow Equivalents)



Capital Expenses: The average replacement value of the survey was estimated to be approximately $1,554,000, not including breeding stock. Included in this estimate are barns ($1,179,952), water, gas, power and other services ($40,410), lagoons ($34,060), machinery and equipment ($209,402), and other buildings ($28,405) dedicated to the hog operation. Land value was estimated at $14,456 for 13.25 acres (5.36 hectares) dedicated to the hog enterprise. Figure 4.25 shows capital expenses by region, size class, and enterprise type.

Figure 4.25 Capital Expenses by Region, Size Class, and Enterprise Type
(Sow Equivalents)



4.3 Generated Multipliers

4.3.1 Wage and Employment Multipliers

The local wage income multiplier is the impact of the subsequent spending of the wage income in the local economy determined by the spending patterns of paid employees relative to their proximity to types of trading centres (MCC, FCC, PSC, CSC, and S/PWRC). The wage multiplier varies both by the location within the province (Census Division) and functional classification of the nearest trading centre.

The Provincial and employment multipliers are a consequence of the basic/non-basic make-up of the Census Divisions in which the operation resides, and the proportion of income comprised of wages. Table 4.2 reports some of the estimated multipliers by a sampling of Census Divisions across Alberta. These Census Divisions were selected both to represent major hog producing areas of the province and to depict the geographic representation of the sample, e.g., some Census Divisions in the South, Central, and North regions. Figure 4.26 shows the location of the Census Divisions.

Functional Classes 1 through 5 range from minimum convenience centre to secondary/primary wholesale-retail. A complete description can be found in Section 3.3.

4.3.2 Local and Provincial Income Multipliers

Income multipliers are calculated based on the proportion of direct spending and subsequent round spending in the regional economy, which varies by Census Division. The income multipliers shown in Table 4.3 were estimated for a sampling of Census Divisions across Alberta. Exclusion of the Hutterite operations from the averages results in a change to the multipliers in the 250-550 sow equivalent size category. These estimated multipliers appear in "( )". This change is anticipated to be a function of spending patterns.

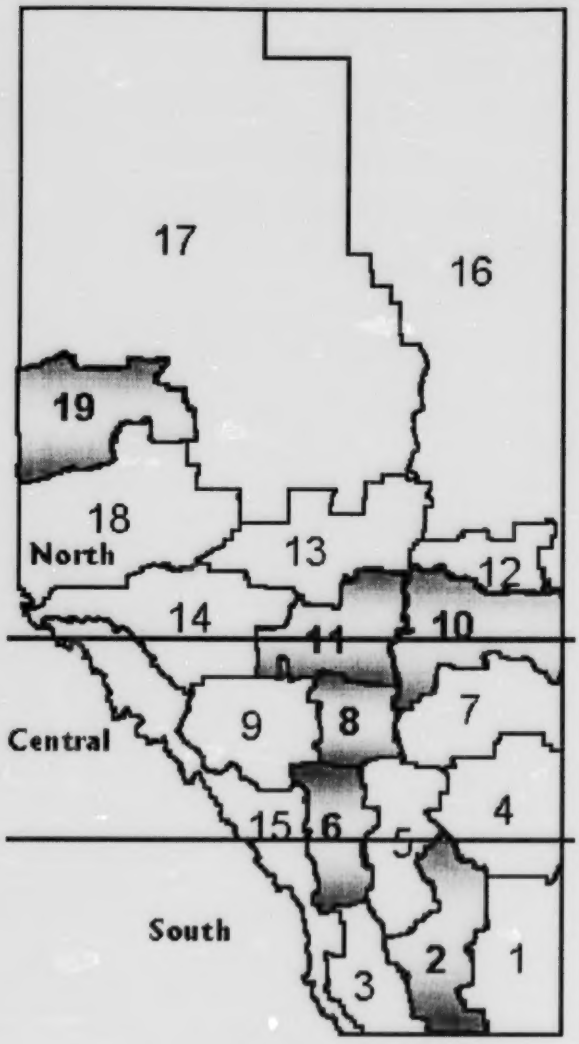
Table 4.2 Wage And Employment Multipliers Across Alberta

Census Division	Provincial/ Employment Multipliers	Local Wage Multiplier by Nearest Type of Trading Centre				
		Functional Class 1	Functional Class 2	Functional Class 3	Functional Class 4	Functional Class 5
2	2.76 / 1.76	1.09	1.89	2.49	2.59	2.70
6	2.80 / 1.80	1.10	1.98	2.64	2.76	2.87
8	2.78 / 1.78	1.09	1.90	2.51	2.61	2.72
10	2.62 / 1.62	1.08	1.82	2.37	2.46	2.56
11	2.94 / 1.94	1.10	1.98	2.64	2.75	2.87
19	2.80 / 1.80	1.09	1.91	2.52	2.62	2.73

Table 4.3 Average Sample Income Multipliers Across Alberta

Census Division	Provincial Income Multiplier	Local Income Multiplier by Size of Operation				
		<50 Sow Equivalents	50-125 Sow Equivalents	125-250 Sow Equivalents	250-550 Sow Equivalents	>550 Sow Equivalents
2	2.76	2.20	2.29	2.24	2.05 (2.10)	2.35
6	2.94	2.32	2.43	2.37	2.16 (2.21)	2.49
8	2.78	2.22	2.31	2.26	2.07 (2.11)	2.37
10	2.62	2.10	2.19	2.15	1.97 (2.01)	2.24
11	2.94	2.32	2.43	2.37	2.16 (2.21)	2.49
19	2.80	2.22	2.32	2.27	2.08 (2.12)	2.38

Figure 4.26 Selected Census Divisions



Note: For reporting purposes, the regions North and North Central were combined and termed "North"

4.4 Respondent Development Plans

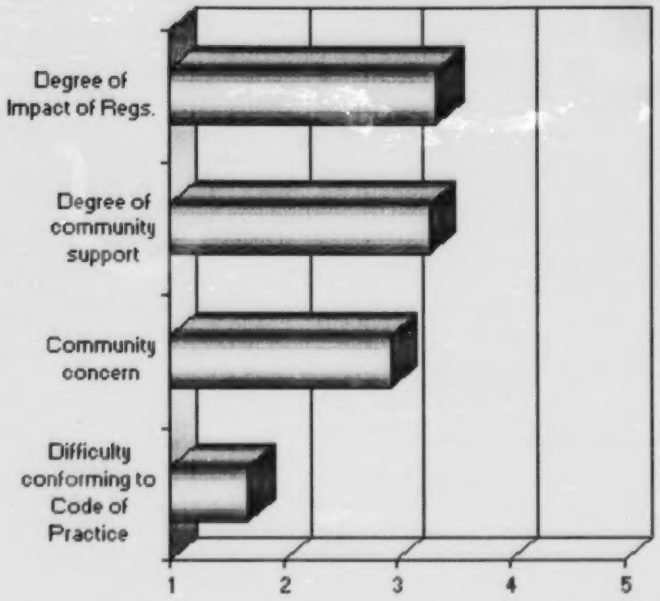
Half of the respondents indicated intentions of expanding their hog operations in the near future. Of these, 32% planned expansions within the next year, 64% within the next five years and 4% after five years. Fifty-nine percent (59%) of the expansions were expected to greater than double their current production base.

4.5 Environmental Practices

Producers were asked to rank how important they considered awareness of local government bylaws and requirements to be. They ranked awareness very high (4.34 out of a scale of 5) (Figure 4.27). The degree to which regulations have impacted their production/expansion plans was rated 3.36 out of 5. The degree

of community support for their business endeavours was rated 3.29 and the degree of community concern for agriculturally induced environmental problems was believed to be only 2.95 out of 5. Producers did not feel that there is any difficulty in conforming to the current Standard Code of Practice (1.68 out of 5 in degree of difficulty).

Figure 4.27 Importance and Degree of Concern to Business



Approximately 15% of the respondents identified difficulty in meeting the requirements of bylaws, standard and requirements. Nearly 41% of all the respondents had received some form of nuisance complaint, primarily with odour, disposal of dead animals and water contamination. Very few had reached a formal process level.

Figure 4.28 illustrates the practices of importance to the operation's success in controlling odour. Practices relative to barn location (distance to the nearest neighbour, setback and shelter) and barn design (manure handling and ventilation) were reported as having the greatest importance relative to control of barn odour, 3.67 and 3.5 on a scale of 5 in importance, respectively. Respondents indicated that odour was worse if barns were set on a hill. Success in controlling odour was also attributed to no in-barn manure storage, the addition of water to pits after draining, manure treatment, and the use of straw for odour control. The use of oils such as canola oil in feed to control dust were also factors which contributed to success in odour control. Manure removal frequency was not viewed as a being of great importance to current success in odour control except with those producers using straw or flush systems.

Figure 4.28 Practices of Importance to the Operation's Success in Controlling Odour

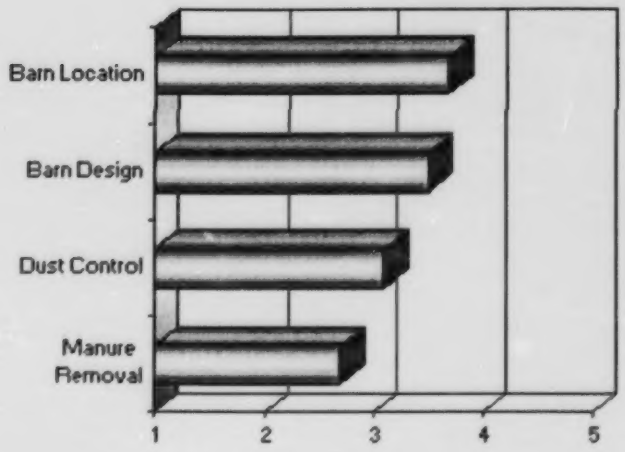


Figure 4.29 illustrates the relative importance of factors to successfully controlling odour from manure storage. Factors viewed to be of greatest importance to success in controlling odour from manure storage were the storage location (3.7 out of a scale of 5), and the setback requirements, aeration, and manure treat-ment (each rated 3.6 out 5 in importance).The maximum storage time was also viewed as being important to odour control (3.4 out of 5). The most common manure storage used was that of earthen basin (12 responses), in-barn storage (6 responses), clay-lined lagoons (4 responses), concrete lagoons (3 responses) and fabricated tank, compost piles and field storage (2 responses each). Setback requirements were of greatest importance to those producers using fabricated tanks (4.8 out of 5) and clay lined lagoons (4.4 out of 5). Storage time was also rated as being very important to those producers using fabricated tanks (4.5 out of 5) and concrete lagoons (3.7 out of 5).

Figure 4.29 Factors Important to Success of Controlling Odour From Manure Storage

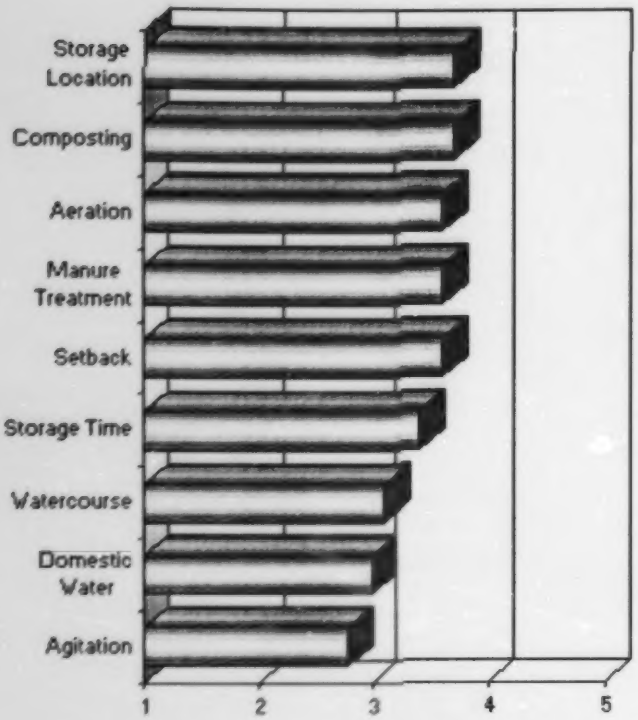
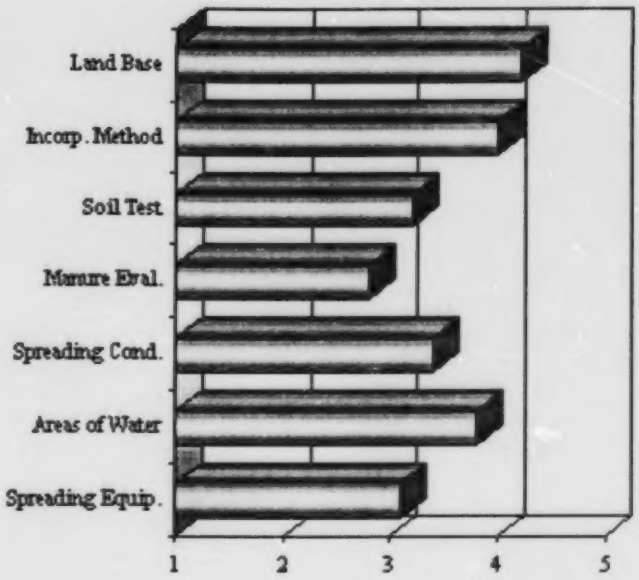


Figure 4.30 displays the relative importance of practices related to the land application of manure to their success in controlling odour.

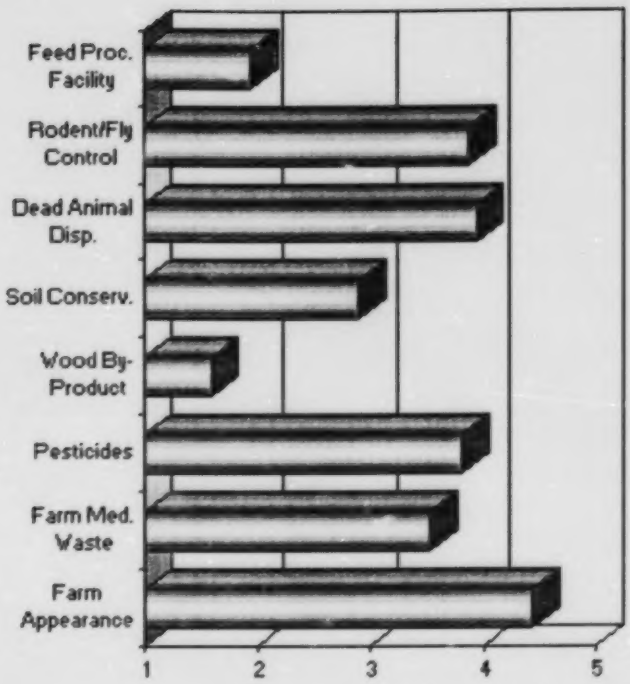
Practices relative to land application of manure were rated very high in importance. Having the appropriate land base, and the incorporation method were viewed as being the most important to successful odour control, 4.2 and 4 out of a scale of 5, respectively. Spreading near areas containing standing water, wells or springs were also of importance (3.8 out of 5). The type of spreading equipment used as well as the weather conditions at time of spreading were considered relatively less important to controlling odour during application. Having the manure evaluated and the soil tested were of least importance. The most prevalent application system was that of liquid (33 responses), followed by a combination of liquid and solid (4 responses) and solid (2 responses). The method of injection was reported to be used by 8 respondents.

Figure 4.30 Importance of Practices During Land Application



Respondents were asked to rate the importance of other factors to their success. Figure 4.31 reports their ratings. Producers rated farm appearance as a very important factor relative to their success (4.43 out of a scale of 5). These included the image, aesthetics and general sanitation of the farm site. Other practices identified as important to the success of odour control were the method of dead animal disposal, rodent and fly control methods, pesticide disposal, disposal of farm medical waste, and soil conservation rated 3.94, 3.87, 3.81, 3.53, and 2.9 on a scale of 5 in importance, respectively. The type, location and setback of the feed processing facility and the use and storage of wood by-products did not factor very high in importance relative to other practices, 1.95 and 1.6 out of a scale of 5 in importance.

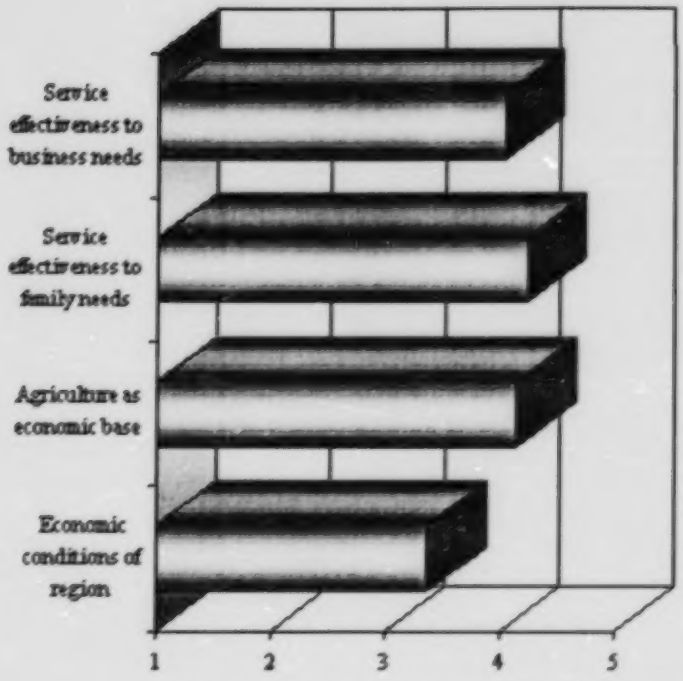
Figure 4.31 Importance of Other Practices



4.6 Community Relations

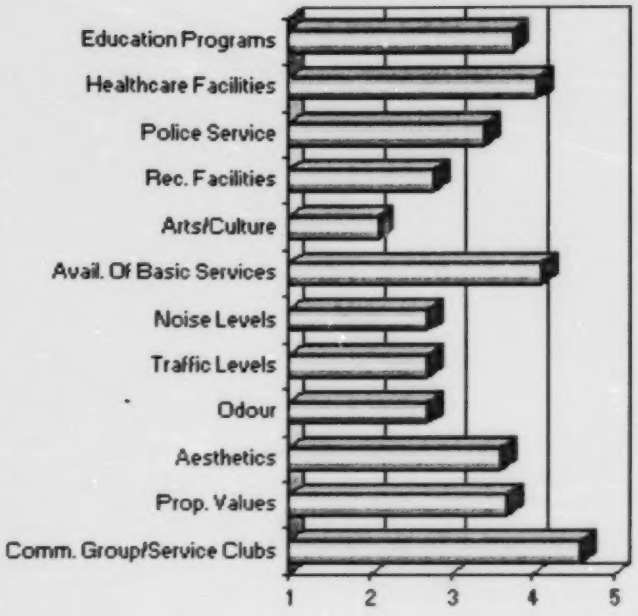
Respondents viewed the overall economic conditions in their particular regions as being of better than average importance to the success of their businesses (3.36 out of a scale of 5). Having agriculture as a major part of their community's economic base was perceived to be of great importance (4.14 out of scale of 5). The effectiveness of existing services in the community at providing viable support to business and family needs was perceived to be of great importance (4.03 and 4.23 out of a scale of 5, respectively). Figure 4.32 shows the relative importance of these factors to business success.

Figure 4.32 Importance To Business Success



Respondents were asked to rank the factors most important to their quality of life. The results are reported in Figure 4.33. The socio-economic factors ranked the highest in importance to the producer's quality of life included community group and/or service clubs (4.58 out of a scale of 5), availability of basic services such as grocery stores (4.1 out of 5), healthcare facilities (4.06), education programs and facilities (3.76), property values (3.7), aesthetics (3.6) and police service (3.4). Housing availability, recreation facilities, noise levels, traffic levels and odour were perceived to be of moderate importance to the producers' quality of life, 2.57, 2.8, 2.7, 2.7, 2.7, respectively. Arts and culture such as theatre and galleries where not viewed as being of importance to quality of life (2.1).

Figure 4.33 Importance of Socio-Economic Factors



Many respondents emphasized the importance of developing a relationship between themselves and their neighbours so that issues could be easily identified, discussed and addressed. The biggest concern for all hog farmers was that of odour. Animals create waste; manure smells. At least thirty-six producers identified the use of several approaches to help their non-hog producing neighbours learn more about their operation and production practices. Several producers used farm tours as a means to build relationships with their community. Approaches have included:

- meeting with all of the neighbours to let them know about any changes or future plans;
- inviting neighbours to tour the farm to see the buildings, to observe first hand the day to day operations of a livestock production facility, and to interact with the residents; and,
- presenting information about the hog operation to the community.

These steps were believed to be the most beneficial to opening the lines of communication. They generate good will through public relations efforts which promote the positive aspects of their work.

Thirty-six of the respondents indicated that they get directly involved in community activities. The

greatest prevalence was in such activities as church (61% of responses), producer organizations and interest groups such as best practices (47%), school and sporting groups (36% each) and community service organizations such as the Rotary Club, recreation boards, agricultural societies and community clubs (6% each). Other organizational involvement was identified as the UFA, Masonics, Agricultural Advisory Council, dispute boards, REA and the fire department.

Thirty-one of the respondents indicated that they encourage community activities on their farm. Such activities were identified as sponsorship or goodwill (16 responses), farm tours (12 responses), counsell-ing and assisting neighbours (6 responses), 4-H activities (5 responses) and other activities such as open houses, and hosting church fun days.

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Last Revised/Reviewed October 9, 1998

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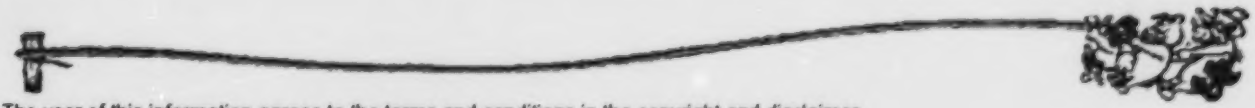

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Use Of Economic Multiplier Results

Socio-Economic Impact Of Hog Operations In Alberta

If used properly, estimates of multiplier effects are a valuable tool for assessing the merits of economic development proposals and estimating economic impacts. Multipliers vary in magnitude by type of functional trading centre and location primarily because larger and/or more urbanized locations have more economic interactions and therefore larger multipliers. Multipliers also vary based on the size of enterprise, reflecting differences in the relationship between inputs and output. In other words, the larger the proportion of income spent locally and the larger the propensity for local expenditures to generate income in the local economy, the larger will be the income multiplier. The propensity to consume locally is expected to be relatively higher in larger communities, in communities located a substantial distance from competitive shopping centres, and in communities where income per capita is relatively low. These factors have been taken into consideration in the economic base model developed for this study.

On-going Operations:
Local wage multipliers reported in Table 4.2 range from a low of 1.08 in Census Division 10 near Minimum Convenience Centres to a high of 2.87 in Census Divisions 6 and 11 near Secondary and Primary Wholesale-Retail Centres. In the latter case, for every $1.00 increase through wages in hog production, nearly $1.87 increase in non-hog industries' wages is generated. Similarly, the provincial wage multipliers ranged from 2.62 in Census Division 10 to 2.94 in Census Division 11.

Employment multipliers ranged from 1.62 in Census Division 10 to 1.94 in Census Division 11. Again, within Census Division 11, for every one job generated in the hog industry, .94 jobs are supported in the non-hog sector.

The income multiplier for the hog sector ranged from 2.62 in Census Division 10 to 2.94 in Census Divisions 6 and 11 indicating that for a $1.00 generated through hog production activity in wages and expenditures nearly $1.62 and $1.94 of income is generated in the non-hog sector.

The estimated impact of hog production activities for the average size of the survey sample (316 sow equivalents) near a secondary or primary wholesale-retail centre are presented in the following table for a sampling of Census Divisions across Alberta. The magnitude of local impact is expected to range from $1.3 million to $1.5 million and provincial impact of between $1.6 and $1.8 million.

Estimated direct and multiplier effects of hog production activities for operations with greater than 550 sow equivalents (average of 1,000 sow equivalents) near a Secondary or Primary Wholesale-Retail Centre (i.e., Calgary, Edmonton, Red Deer, Lloydminister, Grande Prairie), are presented in Table 5.2. As a result of production expenditures, the impact to the local economy is estimated between $3.5 million to $3.8 million each year. Provincial economic impact is estimated to be in magnitude of between

$3.9 million and $4.4 million.

Table 5.1 Estimated Impact of on-Going Operations of the Survey Sample
(316 sow equivalents)

Census Division	Wages		Employee FTEs		Income		Total	
	Local	Provincial	Hog	Non-Hog	Local	Provincial	Local	Provincial
2	$220,262	$225,262	2.44	1.85	$1,183,290	$1,477,699	$1,403,474	$1,702,961
6	213,515	218,617	2.44	2.30	1,250,600	1,575,610	1,464,115	1,794,227
8	211,934	216,842	2.44	1.90	1,190,956	1,488,851	1,402,890	1,705,693
10	210,358	215,059	2.44	1.51	1,132,107	1,403,246	1,342,465	1,618,305
11	217,052	222,233	2.44	2.28	1,248,470	1,572,512	1,465,521	1,794,744
19	200,470	205,130	2.44	1.94	1,197,343	1,498,141	1,397,813	1,703,271

Table 5.2 Estimated Impact Of On-Going Operations Of A Hog Operation Within Selected Census Divisions Across Alberta
(1,000 sow equivalents)

Census Division	Wages		Employment -FTEs		Income		Total Economic Impact	
	Local	Provincial	Hog	Non-Hog	Local	Provincial	Locally	Provincially
2	$725,417	$742,146	8.53	6.46	$2,915,717	$3,419,875	$3,641,134	$4,162,021
6	$703,446	$720,254	8.53	8.02	$3,089,911	$3,646,472	$3,793,357	$4,366,727
8	$698,236	$714,407	8.53	6.64	$2,935,557	$3,445,683	$3,633,792	$4,160,091
10	$693,043	$708,532	8.53	5.28	$2,783,257	$3,247,567	$3,476,300	$3,956,099
11	$715,097	$732,167	8.53	7.97	$3,084,399	$3,639,302	$3,799,496	$4,371,469
19	$660,468	$675,819	8.53	6.79	$2,952,085	$3,467,184	$3,612,553	$4,143,003

It must be noted that multipliers indicate nothing about the profitability of the proposed or existing hog enterprise. Decisions for or against a particular development must take into account the financial viability of the enterprise, in addition to the economic multipliers.

Development Impacts:
In addition to on-going activities of hog operations, information relative to replacement value of assets was gathered through the surveys. This information is valuable in assessing impacts of new developments during the construction phase. During construction, there are purchases of materials (lumber, steel, cement, etc.), labour, engineering, instrumentation, etc. which will generate increases in gross domestic product, labour and employment for an estimated construction period of between four to six months. Multipliers for the construction sector are estimated by Alberta Treasury and published periodically. Data relative to capital expenditures appears in the appendix. For example, for the development of a operation >550 sow equivalents (average of 1,000 sow equivalents), it is estimated that capital costs would be in the magnitude of the following:

Barns	$3,267,143
Services	$107,857
Lagoon	$114,286
Machinery and Equipment	$425,714

Other Building	$74,214
Residence and Housing	$246,607
Land ~20 acres (8.09 hectares)	$25,267

Total Not Including Breeding Stock $4,261,089

It is estimated by the respondents that approximately 79% of the total capital cost of $4,261,089 (not including breeding stock) could be purchased within the region (50 km radius).

In summary, hog operations exert a major quantifiable economic influence over the surrounding community. They convert grains and by-products of crops into marketable product (meat) and provide jobs for area residents, encourage diversification on farms and contribute substantially to the local community. The second phase of this study will further explore the social and environmental impacts of development projects. In general, producers are interested in:

- how different management practices affect quality of life and linking hog production with community and environmental resources; and,
- how to best encourage mutual economic diversification and sustainability of rural communities and hog operations.

Several comments relative to producer concerns include:

- declining number of small hog operations;
- no consistency among municipal regulations;
- AAFRD viewed as too vocal regarding hog expansion numbers;
- developers meet all requirements and are "shut-down" in the appeal process;
- concern regarding their ability to conform to the upcoming Code of Practice; and,
- concern regarding water well licensing (delays in obtaining, costs prohibitive).

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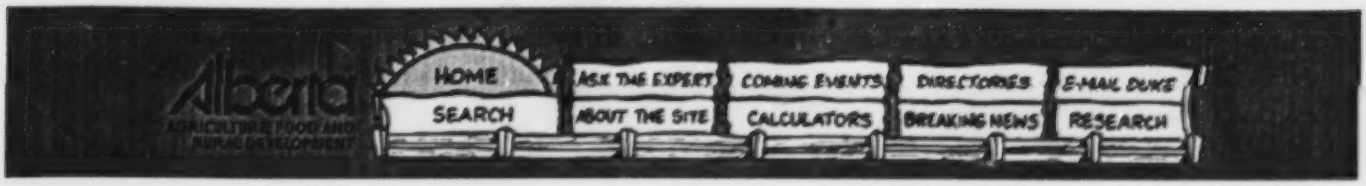

Introduction

Socio-Economic Impact Of Hog Operations In Alberta

Public concern related to environmental problems of intensive farming are jeopardizing the expansion of the pork industry. This concern is spurred by the high visibility of larger-sized operations, the increased media, activist and consumer group attention, and lifestyle choices of citizens. Producers, priding themselves as being good stewards of the environment (land, water, and air), are in pursuit of a higher quality of life while ensuring environmental quality. Sustainable development links environ-mental, economic, and social factors.

A by-product of hog production is manure. The more hogs, the more manure. Large concentrated herds generate large amounts of manure, urine, and dead animals in a relatively small area. While manure is a good source of nutrients, it is a wet, bulky, and difficult product to manage. Producers must regularly collect, store, handle, treat, transport, and apply the manure. Each of these activities costs the producer a substantial amount of time, equipment, and money. And each activity can release odour if not properly managed.

Public sensitivities and reactions to odours are, like fingerprints, individual and specific. They are influenced by personal preferences, opinions, experiences, and the varying sensitivities of our olfactory systems. Odours can irritate, anger, or upset us, especially if we associate them with something threatening, unpleasant, or beyond our control. The extreme variability of sources, causes, environmental factors, and human response makes it difficult to measure swine odours or determine some objective limit for odour emissions. The problem is compounded by the fact that an odour's offensiveness does not always correspond to its intensity. Several devices have been used to measure odour such as the scentometer and the olfactometer.

Perception of odour is governed by:

- the amount of control over the odour – if neighbours believe that a swine farm has been located nearby without regard for their comfort or property values, they may be more likely to find its odours offensive;
- understanding the nature of the livestock business – neighbours may tolerate a problem better if they understand how it works;
- perception of the hog industry – neighbours may be inclined to associate pig and swine farms with uncleanliness; and,
- length of exposure – as people are constantly exposed to an odour, they may lose the ability to detect the odour.

These perceptions help explain why complaints are most likely to occur when new farms locate in areas where people are unfamiliar with hog production.

If manure is not managed properly, water supplies can be endangered. Nutrients in hog manure can contaminate both ground and surface waters. Bacteria and micro-organisms from dead animals can also contaminate groundwater. Poorly managed swine-growing operations can pose a potential threat to water quality in two ways. If growers apply too much lagoon liquid to fields or if lagoons seep, nutrient levels in the soil can rise to unacceptable levels, threatening ground and surface water quality.

The second phase of this report applies the multipliers developed in Phase I of this study to measure the economic benefits stemming from hog production; identifies and interprets any effect on the socio-economic environment caused by hog production activities; and provides information to supplement environmental management. These efforts are expected to augment information and materials necessary for reassuring rural and urban residents relative to development sustainability. This study information can be used for planning of optimal environmental resource use for long-term enhancement of environmental capacity and quality. Quality is based on human perceptions and values, thus qualitative assessment is necessary.

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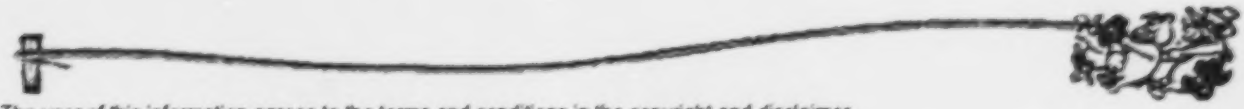

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Conceptual Framework

Socio-Economic Impact Of Hog Operations In Alberta

[The Case Studies | Neighbourhood Survey | Community Focus Groups]

Specific measures and steps undertaken during the second phase of the study included:

- direct application of the economic multiplier instrument to five case studies;
- survey of adjacent and near property owners to assess neighbour concerns and issues; and,
- community focus groups within the vicinity of the case studies.

2.1 The Case Studies

Several factors were taken into consideration in the selection of appropriate case studies in Alberta, including:

- stage of development – ensuring a representa-tive cross-section from permitting, to construction, to near completion;
- receptiveness of communities – including a range of municipalities viewed to be open to growth opportunities and those perceived to be closed or indifferent;
- type and size of operation – expansions ranging from 30% increases in herd size to 133% and including not only farrow to finish operations, but specialized production such as segregated early weaning units;
- environmental sensitivity – including sites perceived to have potential environmental sensitivities such as gravel pit areas; and,
- municipal experience based on the number of development permits issued.

Five candidates were selected. These sites were regionally dispersed across the province. Four of the cases represent expansion initiatives and one was a new development investment. Two of the projects were recently completed, one was underway, one had plans for construction in just over a year, and another planned start-up within five years. The size of projects ranged from 350 to 1,500 sow operations, four of which were farrow-finish and one a farrow-wean. A summary of the expansion/investment plans is as follows:

Table 2.1 Case Study Profiles

	Case A	Case B	Case C	Case D	Case E

Expansion or Investment Plan	Expanding from 500 sow farrow-finish to 900 farrow-finish, one site, continuous flow, buildings connected	Expanding from 500 sow farrow-finish to 650 sow farrow-finish, three sites, continuous flow	Expanding from 150 to 350 sow farrow-finish, two sites, continuous flow	Expanding from 120 sow farrow-finish to 240 sow, one site, continuous flow, barns not connected	Investment in 1500 sow farrow-wean operation
Status of Project	Expansion underway, Slurrystore installed	Expansion recently completed	Plans are drawn up for completion in two years, site not selected, development permit has not been applied for	Planned expansion within next five years, no plans drawn-up, site is selected	Currently under construction
Special Site Considerations	Site is located on gravel pit area, thus a Slurrystore is built to ensure no lagoon seepage problems	Adjacent quarter section was purchased as a safeguard against acreage encroach-ment, shelterbelts and separation distances given greater emphasis	Special consideration given to shelter-belts and neigh-bour relations	Shelterbelts of trees and lagoon placement given special consideration	Efforts to select site which provided a minimum radius of 2 miles from other farm-steads – project is a community-based building project (shareholders)

For each case study, information was gathered relative to future projections of feed use, input spending patterns, labour requirements, capital investment, and measures to address environmental issues of the proposed expansion/investment.

Figure 2.1 Locations of Case Studies

Insert map graphic here

2.2 Neighbourhood Survey

In order to better understand how neighbouring citizens respond to swine expansion projects in their communities, individuals in the immediate and surrounding vicinity of the five case studies were interviewed. The immediate area comprised a 1.6 km diameter around the case study site and the surrounding vicinity spanned an additional 2.4 kms. Attempts were made to contact all residents within the immediate area and as many landowners as possible within the near vicinity. A total of 73 interviews were completed in five case study areas.

Citizens within the communities could not be categorized as homogeneous. There was no single populace, but rather a multitude of publics defined by their level of interest in the case study or project. The levels of interest ranged from unaware and apathetic to project decision influencers. The apathetic group were not ignorant of what was going on, but had decided that they were not affected. Some chose to observe, read reports, newsletters, etc. to keep aware of the progress, but rarely communicated their findings with others. On the other side of the spectrum were a minority of citizens who attended meetings and made time to participate in public awareness efforts. These individuals were concerned citizens that viewed themselves as stakeholders who would decide on the success of the project. They wanted and needed reliable information on the impact of the development.

2.3 Community Focus Groups

Five community focus groups were held in the same vicinity as the case studies. Participants included 8 to 12 representatives from the community comprised of bankers, veterinarians, county and town councils, schools, churches, health authorities, retail businesses, construction companies, equipment dealers, etc. Emphasis was placed on identifying the impacts of intensive livestock operations in the areas of community and municipal relations, infrastructure, quality of life, the economy, and environment.

The structured working sessions were designed to identify development evaluation criteria and determine their relative importance. Although the meetings were limited by the number of attendees (8 to 12), they proved to be an excellent forum for interactive communication.

Participants within the working sessions were posed questions pertaining to the importance of agriculture to their community, impacts of expansion, concerns regarding air and water quality and soil impairment, and identification of key components for environmental management planning. Quality of life factors such as the community's ability to provide the majority of workers needed for expansion projects, availability of housing, pressures on existing school facilities and non-school facilities, services such as police and fire protection, roads, recreation and library, health and hospital, etc. were also addressed.

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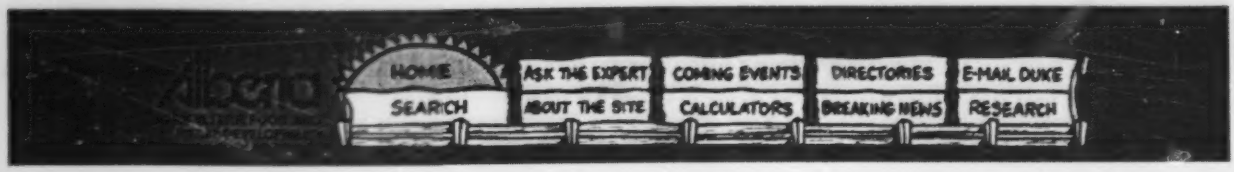


Case Study And Socio-Economic Findings

Socio-Economic Impact Of Hog Operations In Alberta

| Economic Impact Of Case Studies | Neighbourhood Reaction And Relation Building | Community Receptiveness And Components For Environmental Planning |

3.1 Economic Impact Of Case Studies

3.1.1 Income and Employment Generated by Case Study Examples

1. **Construction Phase**

The construction phase for hog expansion or investment projects typically spans a five to seven month period, depending on the size of the project. The one-time impact of constructing production facilities can be expressed in terms of the generated gross domestic product (GDP) (at factor cost), labour income, and employment (person years). This is done through application of established multipliers from Alberta Treasury. For example, the expansion of a 500-sow farrow-finish operation to a 900-sow operation in Case Study A will generate increases of $646,000 in GDP, $487,000 in labour income, and 10.6 person years during the construction phase.

Table 3.1 Estimated Economic Benefit of Construction

	Capital Cost	GDP at Factor Cost	Labour Income	Employment (PY)
Case A	$1,000,000	$ 646,000	$ 487,000	10.6
Case B	570,200	368,349	277,687	6.0
Case C	1,214,000	784,244	591,218	12.8
Case D	620,000	400,520	301,940	6.5
Case E	4,831,340	3,121,046	2,352,863	51.0

2. **Ongoing Operations**

The economic multiplier model developed in Phase I of this study was used to project the income and employment impact generated by the additional production activity of each expansion and investment project. This was based on their individual financial and physical data. The findings have been summarized in the Table 3.2 below.

Table 3.2 Production Activity Impact

Expansion	Local Impact	Provincial Impact	FTEs	
			Hog	Non-Hog
Case A (500-900 sow)	$1,557,806	$1,617,850	5.14	4.01
Case B (500-650 sow)	508,055	1,013,796	0.9	0.48

Case C (150-350 sow)	1,258,914	1,338,858	1.54	1.45
Case D (150-240 sow)	549,864	550,707	0.4	0.24
Case E (1,500 sow)	4,802,449	5,249,915	8.53	5.07

The total economic benefit generated by expansion and investment in the Case Study examples ranged from over $500,000 to over $5.2 million. The amount of the total benefit retained within the local community is dependent on factors such as the proximity of the hog operation to the nearest community, the amount of economic activity generated by the operation, and linkages to other businesses in the community. With the exception of Case Study B, most (over 90%) of the economic benefit generated by the projects are anticipated to remain within the local 50 km area. The economic impact within the local community of the case studies is projected to range from over $500,000 per year in Cases B and D, to over $1.5 million in Case A and nearly $5 million in Case E. It should be noted that the case studies were farrow to finish and farrow to wean operations.

3.1.2 Issues Facing the Developer

Issues faced by the new or expanding hog operations included:

1. *Development Approval Process:* Developers expressed that the inconsistencies in development standards between municipalities could force developers to meet standards other than the provincially-recognized development standards. Further, municipal commissions and boards are perceived as not being adequately prepared to deal with complex technical development matters that go beyond land use considerations. There is also concern that appeals are being launched after Development Permits are issued.
2. *Prohibitive Water License Costs:* Case study participants implied that rising licensing costs and requirements were challenging the benefits/gains of economies of size. Costs for hydro-geological reports were approaching in excess of $14,000. Additional requirements were also creating time delays for obtaining licenses – as long as 8 to 10 months.
3. *Uncertainty Relative to Community Receptive-ness:* Producers accept that they must communicate with the community, but would also like the community to understand the economic/ environmental requirements of hog operations.
4. *Heightened Environmental Concern and Prevalence of Media Controversy:* Environmental concerns are being expressed not only by acreage owners, but also by nearby grain and feedlot producers. Concerns from the examples cited were considered unwarranted and unfounded.
5. *Code of Practice Implications:* Uncertainty relative to ramifications of the revised Code of Practice, with implications related to capital outlay and enforcement for compliance.

3.1.3 Measures to Alleviate Concerns

Case study participants were proactively taking measures to alleviate any anticipated concerns relative to their expansion or investment projects. Some of these measures included:

1. *Enhanced Manure Storage:* Investments in Slurrystore systems ranged from $100,000 to $500,000. Storage solutions were planned to accommodate 12 to 13 months capacity.
2. *Investment in Manure Application Technology:* Injection equipment and dribble application equipment was purchased for manure spreading purposes. Traditional spreading techniques were being abandoned.
3. *Improved Neighbour and Community Relations:* Consultation with neighbours was considered to be a first priority. Case study participants made efforts to be perceived as good corporate citizens, including full disclosure of plans, providing general information about intensive livestock practices, encouraging on-site visits and open houses, hosting special events, participating in community activities, and deliberately shopping locally to support the local area.

4. *Soil and Water Testing Processes Established:* Environmental monitoring was considered part of the planning and construction process, including monitoring water quality by sampling from runoff water upstream and downstream, soil testing to prove phosphorus levels were not building up, and establishing monitoring wells.
5. *Site Selection and Design Considerations:* Developers are carefully considering topography, presence of shelterbelts, aesthetics, and prevailing wind direction in site selection and design.
6. *Early Application for Water Licensing:* To ensure minimal delay during the construction phase, developers are applying for water well licensing six to eight months in advance.
7. *Securing Adjacent Property:* Developers engage in securing adjacent properties to avoid acreage encroachment and expand base for manure disposal. They are also obtaining other lands as required, by agreement, for manure disposal.

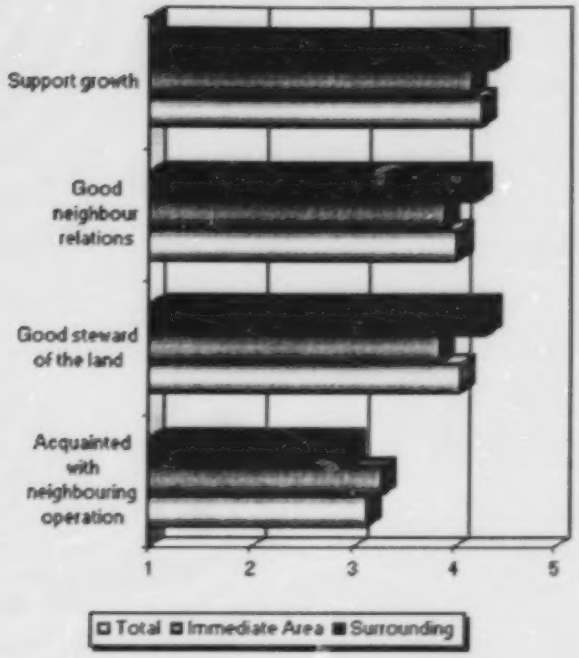
3.2 Neighbourhood Reaction And Relation Building

3.2.1 Neighbour Familiarity With Expansion Projects

Neighbours were asked to rate several factors relating to their familiarity of the nearby hog operation (case study) on a scale of 1 to 5, with 1 = not familiar; and 5 = well aquainted. Interviewees reported a familiarity with the neighbouring hog operation (the case studies), with a rating of 3.14 out of a scale of 5 (Figure 3.1). Those owning property within the immediate area (1.6 km diameter around case study site) were slightly more familiar with the hog operation (3.27 for immediate neighbours versus 2.97 for those within the surrounding area). Surrounding area neighbours span a vicinity of an additional 2.4 kms around the case study site.

On average, the case study operators were perceived to be good stewards of the land and animal resources (4.05 on a scale of 5 for good stewardship). Neighbours in the surrounding areas conveyed higher ratings for stewardship than those in the immediate area (4.32 versus 3.85, respectively). The hog operators of the case studies were also cited as demonstrating good neighbour relations and support for their community (4.02 on a scale of 5 for support). Again, neighbours in the surrounding area perceived the operators to demonstrate greater support and better neighbour relations than those immediately adjacent (4.21 versus 3.89, respect-ively). All neighbours considered themselves to be strong supporters of sustainable growth of the livestock sector (4.26 on a scale of 5 for support). Those in the surrounding area perceived themselves to be stronger supporters than those within the immediate vicinity (4.38 versus 4.16, respectively).

Figure 3.1Neighbour Familiarity With Expansion Projects



3.2.2 Importance of Socio-Economic Factors

Interviewees suggested that overall, socio-economic factors associated with health and safety, education, and property values were considered more important than those which impact housing, municipal services, recreation, and lifestyle. Figure 3.2 illustrates both the relative importance of the quality of life factors and the degree of influence the case study has on each individual quality of life factor as perceived by the entire neighbourhood. Figures 3.2(a) and 3.2(b) further breaks down the ratings by the immediate neighbours only, and the ratings given by the surrounding neighbours. The case studies are perceived to have little to no negative impact on quality of life factors viewed as being important by neighbours within the vicinity of the hog production sites.

The socio-economic factors rated as most important to survey participants' quality of life were identified as water quality (4.66 on a scale of 5 in importance), healthcare facilities and basic medical care within 15 minutes (4.62), soil contamination and erosion (4.44), education programs and facilities (4.38), availability of basic services such as groceries (4.37), police service (4.23), aesthetics (4.06) and property value impact (4.0) (Figure 3.2). Little if any differences were detected in responses between the immediate and surrounding neighbours, with the exception of the order of priority between water quality and healthcare facilities, and the availability of basic services (Figures 3.2(a) and 3.2(b)).

The degree of influence of the case study (Figure 3.2) on the socio-economic factors was perceived to be minimal, ranging from a low of 1.25 for arts/culture factor to a high of 2.05 for odour (on a scale of 5). Although the average rating of degree of influence from immediate neighbours was higher than that of the surrounding area, the average rating of influence did not exceed 2.27 (odour factor). For graphical representation of these findings, refer to the Quality of Life factors as rated by the immediate neighbours and surrounding neighbours, respectively, which immediately follow on Figures 3.2(a) and 3.2(b).

Figure 3.2 Quality of Life Factors – Total Neighbourhood

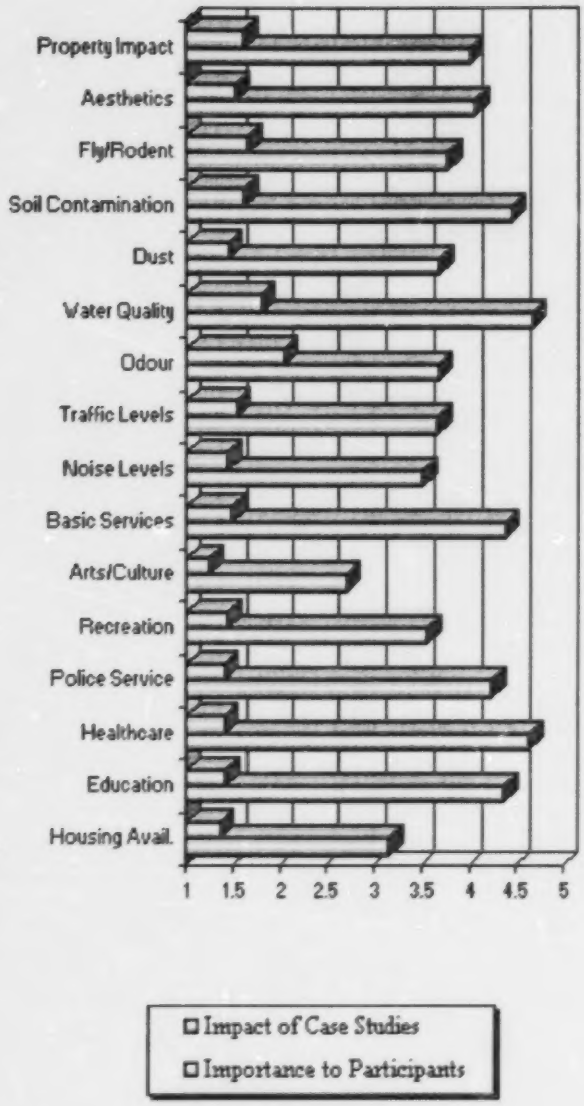


Figure 3.2(a) Quality of Life Factors – Immediate Neighbours
(1.6 km diameter around case study site)

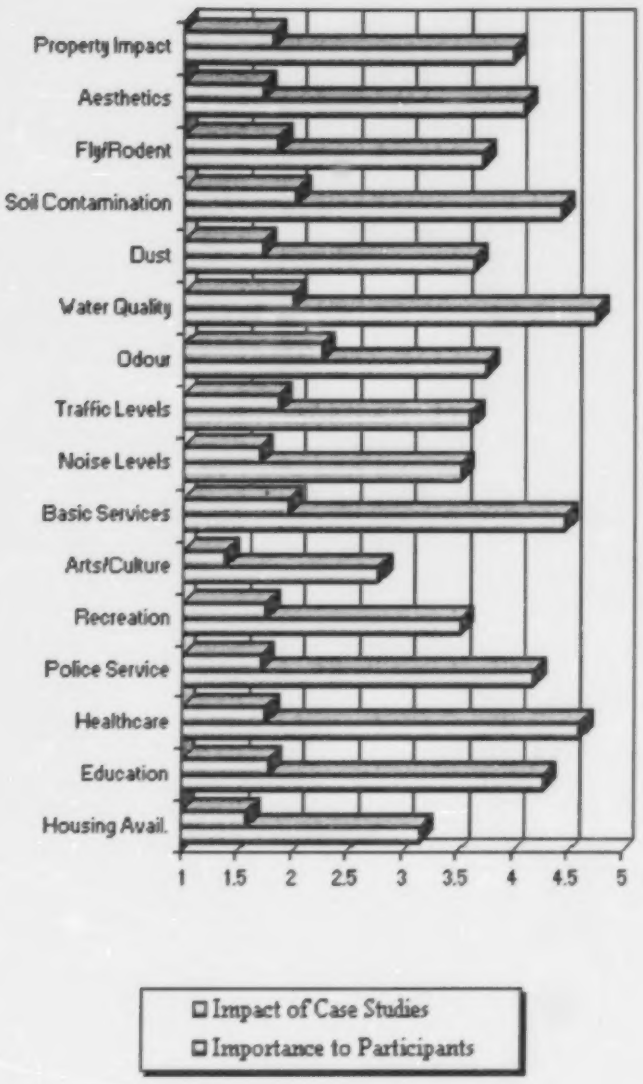
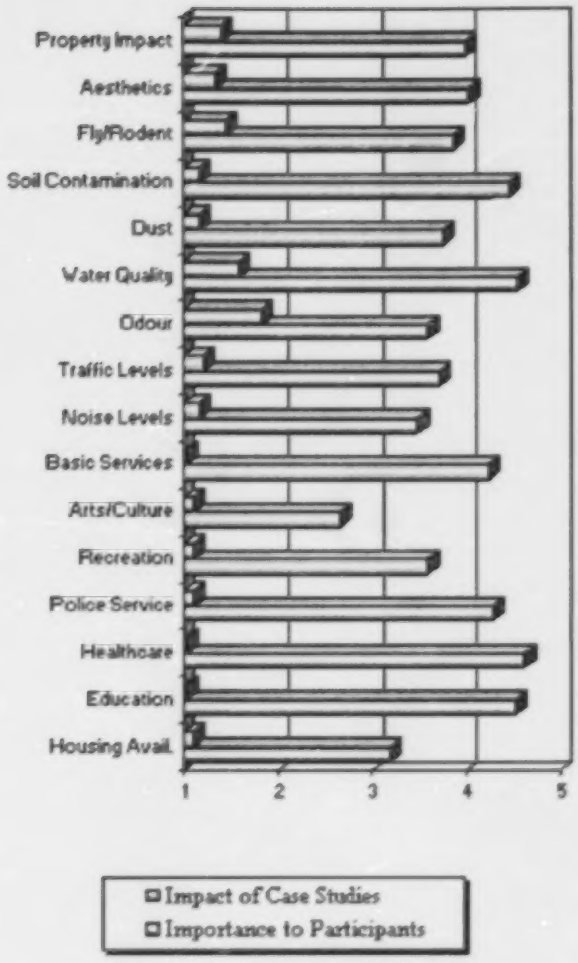


Figure 3.2(b) Quality of Life Factors – Surrounding Neighbours
(1.6 to 4.0 km diameter around case study site)



3.2.3 Factors Contributing to Concerns

Neighbours were asked to rate factors contributing to concerns with the nearby livestock operations on a scale of 1 to 5 with 1 = not concerned, and 5 = very concerned (Figure 3.3). In total, more than 40 specific contributing factors were investigated. Little concern with neighbouring hog operations (both current and proposed expansion) was evident relative to factors that contributed to animal health, noise, dust, rodent and insect, neighbour relations, human health, soil erosion or contamination, odour, and water quality.

The factors identified as contributing the greatest concern with the existing nearby livestock operation (on a scale of 5) were manure disposal impact on odour (2.1), manure application method on soil erosion and contamination (2.03), wind direction impact on odour (1.92), leaching and runoff impact on water quality (1.89), groundwater and distance from surface water impact on water quality (1.88 each), available land for spreading impact on soil contamination (1.83), use of growth promoters and antibiotics impact on animal health (1.81), and low public confidence due to media impact on neighbour relations (1.74). Factors contributing to noise and dust were rated

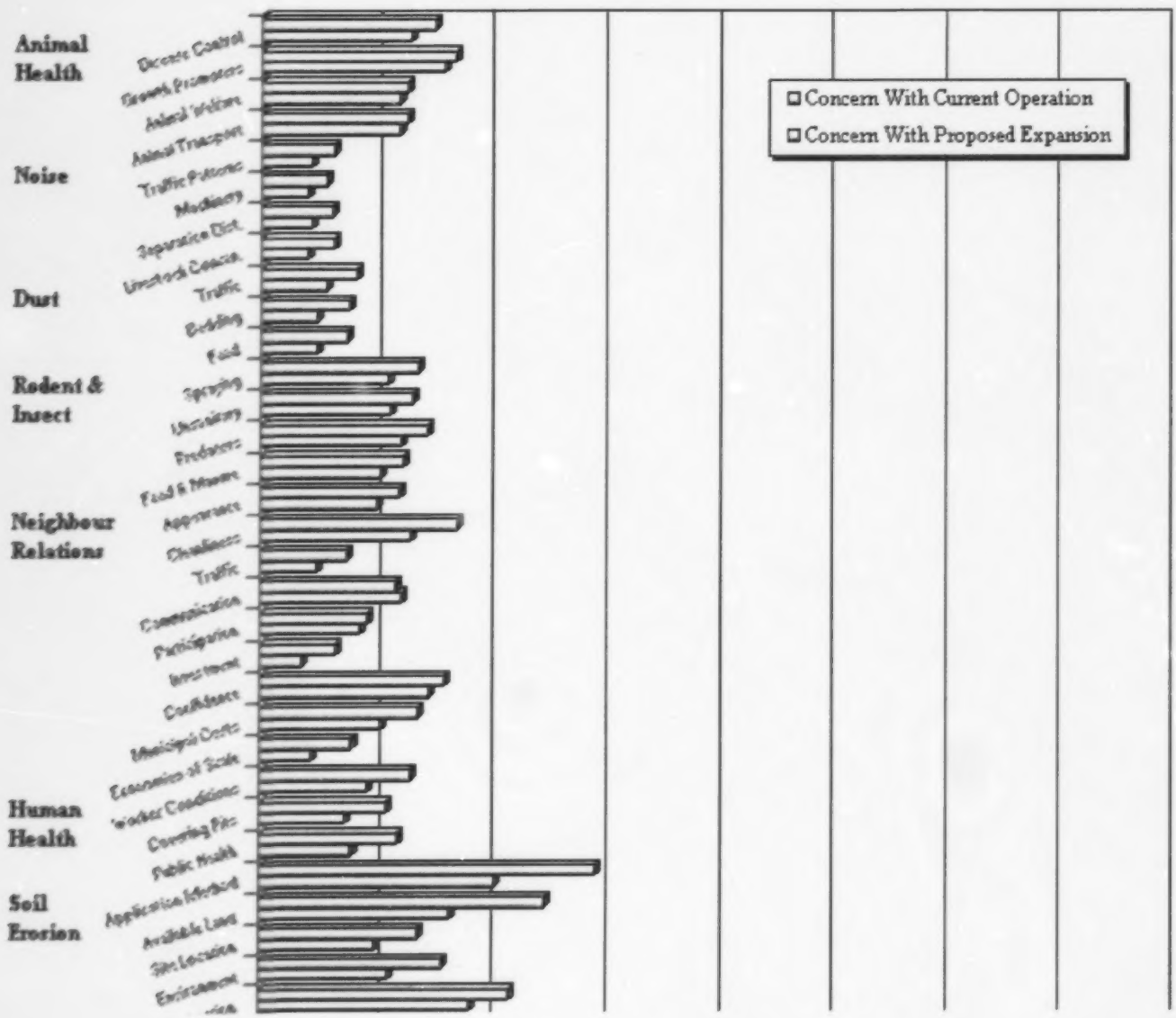
relatively low as to degree of concern.

In general, the degree of concern relative to contributing factors rose in relation to the proposed expansion site versus the current facilities. For the proposed site, the order of ranking relative to degree of concern changed. Of greatest concern were the factors of application method, manure disposal, availability of land, groundwater quality, wind direction, manure storage system, leaching and runoff, distance from surface water, climatic conditions, ammonia emissions, and buffer zones and setbacks.

Figure 3.3 is further broken down into ratings as provided by the immediate neighbours only and ratings given by the surrounding neighbours.

Neighbours within the immediate vicinity expressed greater concern with communication and public confidence than that of all neighbours combined.

Figure 3.3 Factors Contributing to Concern – Total Neighbourhood



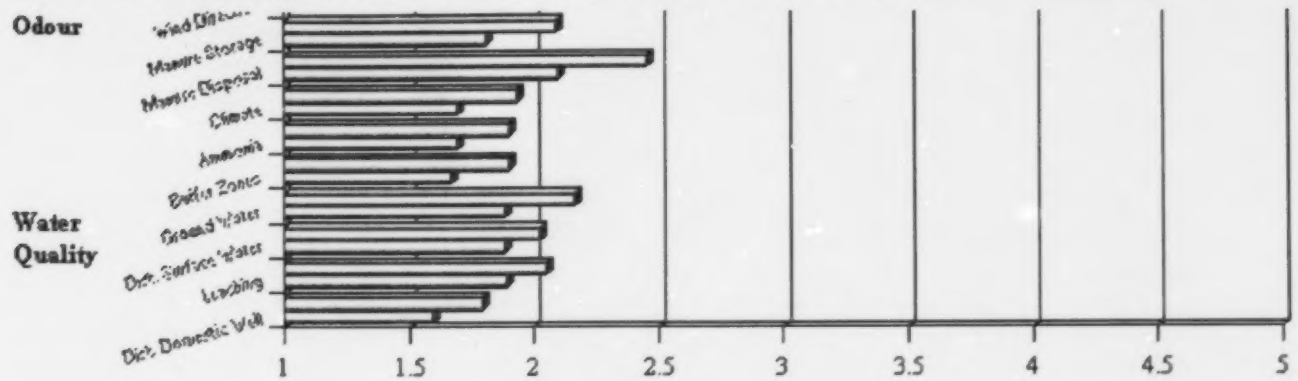
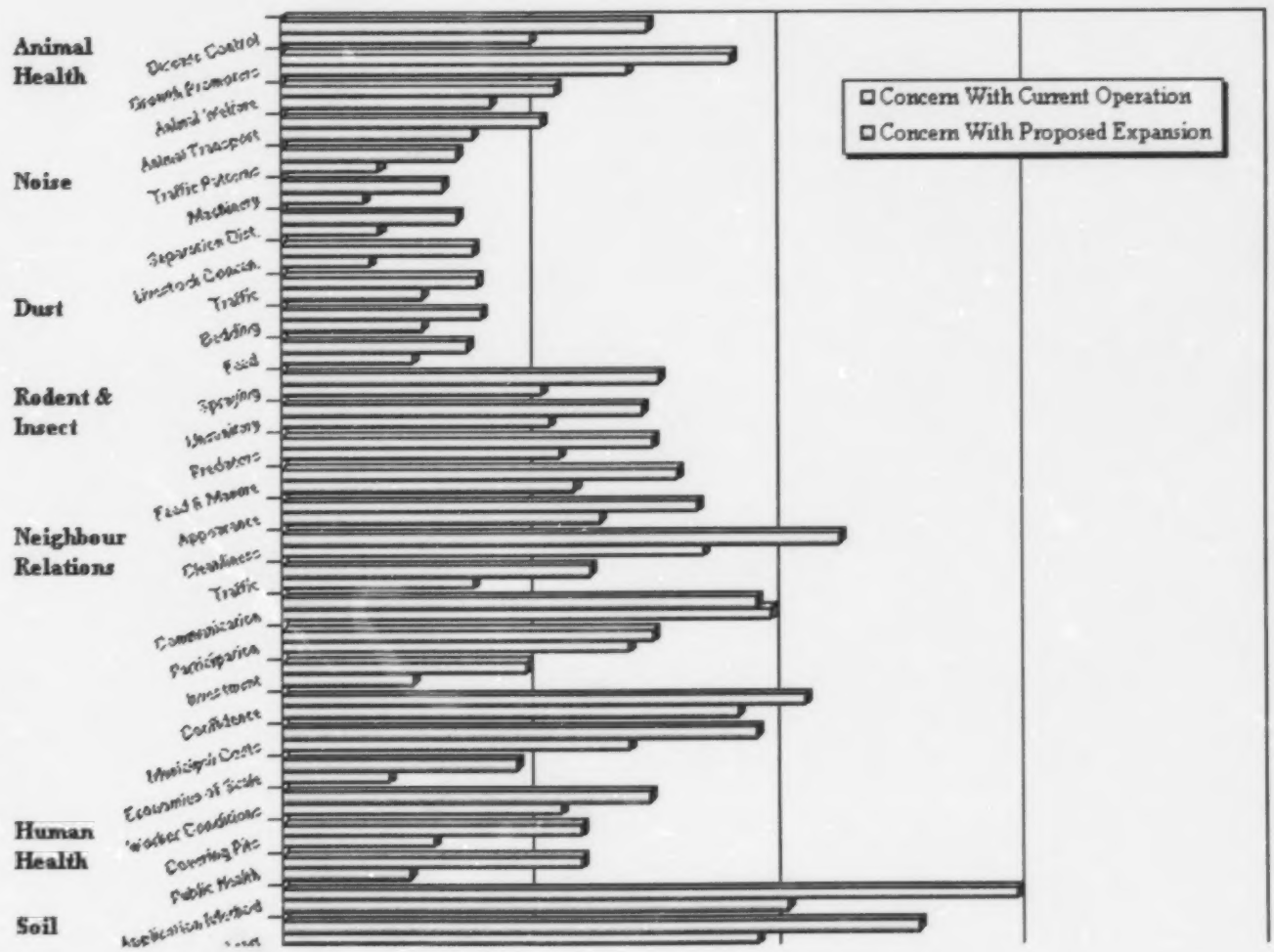


Figure 3.3(a) Factors Contributing to Concern – Immediate Neighbourhood
(1.6 km diameter around case study site)



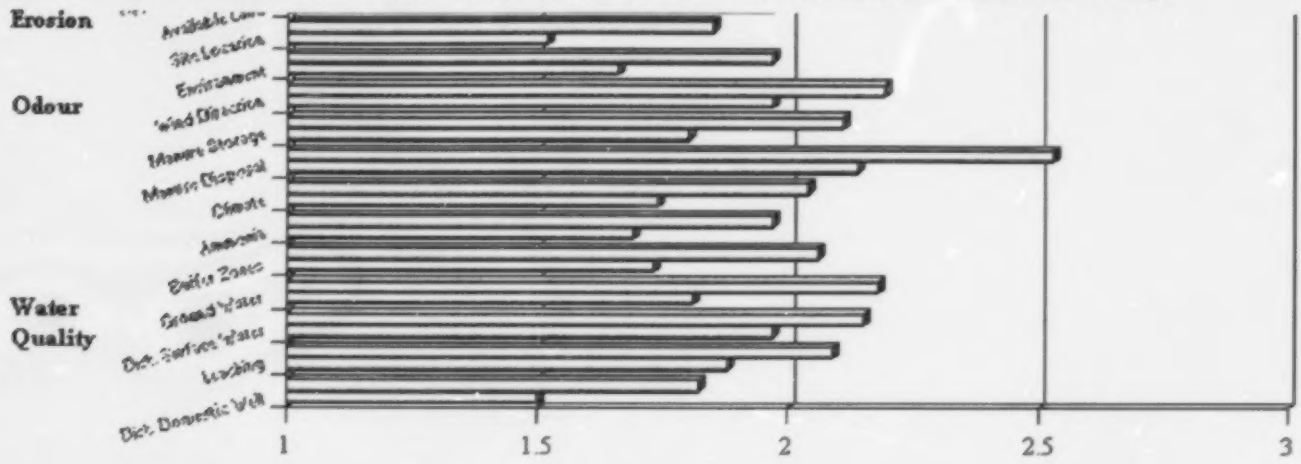
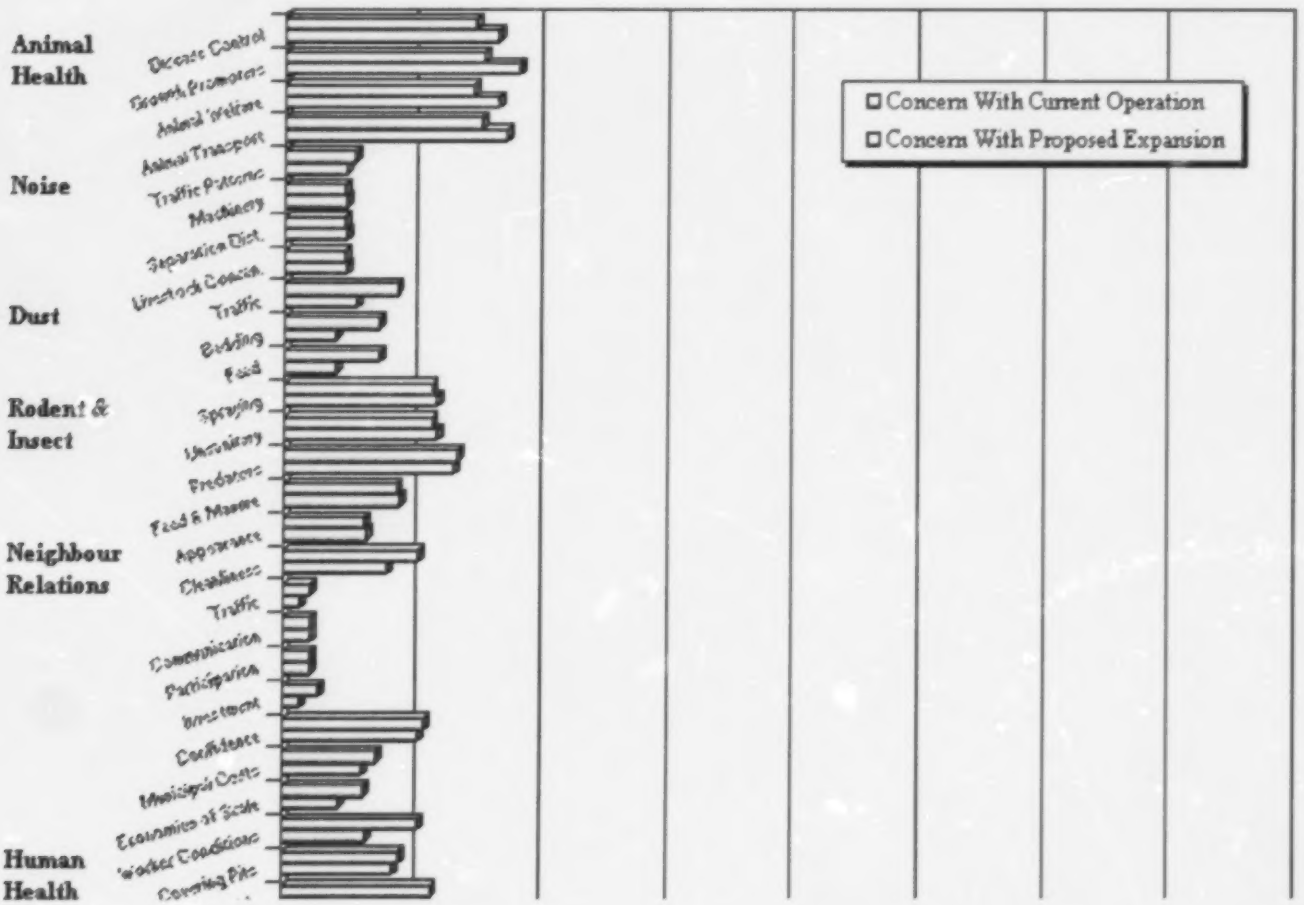
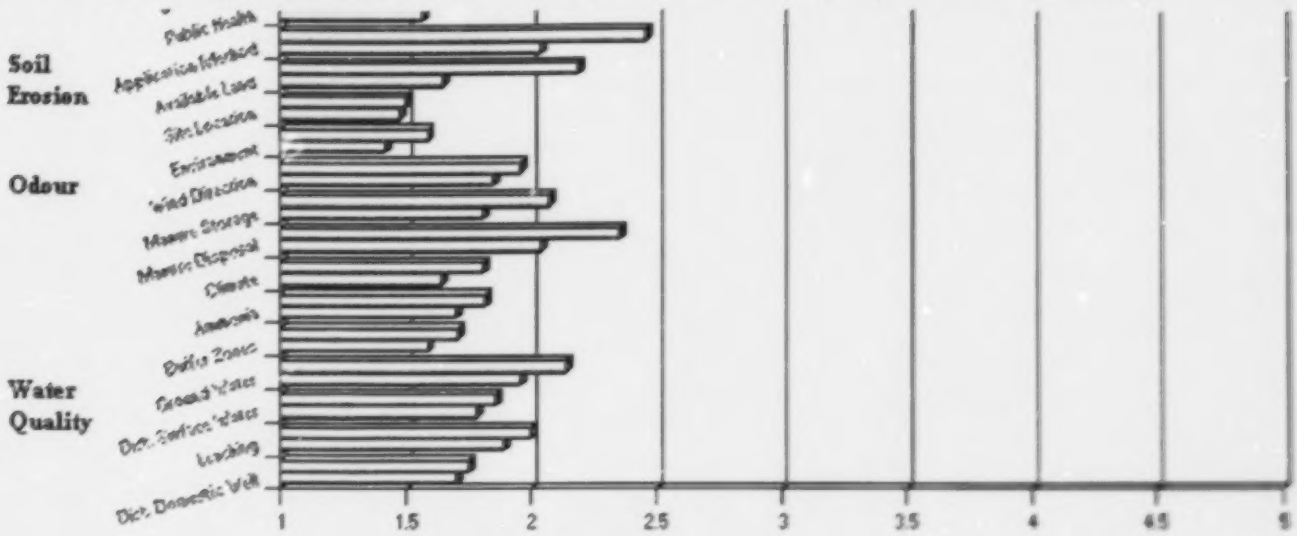


Figure 3.3(b) Factors Contributing to Concern – Surrounding Neighbourhood
(1.6 to 4 km diameter around case study site)





3.2.4 Instances of High Concern

Instances of high concern, where factors contributing to concern were rated greater than 4 on a scale of 5 relative to degree of concern, were very infrequent. Relative to more than 40 possible factors contributing to concern, only 18 instances of high concern out of over 3,500 responses were reported. Of these 18 instances, 11 related to odour, 6 pertained to water quality, and 1 pertained to traffic.

For instances of high concern, attempts were made to have respondents quantify and qualify the nature of concern. With odour nuisance concerns, respondents were asked to characterize the degree of unpleasantness on a hedonic tone rating scale. Hedonic tone is a measure of the pleasantness or unpleasantness of an odour sample. The hedonic tone is independent of its character. An arbitrary but common scale for ranking odours by hedonic tone is the use of a 20 point scale from -10 (unpleasant) to 0 (neutral) to +10 (pleasant). The assigning of a hedonic tone value to an odour sample by a respondent is "subjective" to that respondent. The respondent uses his/her personal experience and memories of odours as a referencing scale. The average value of the odour panel is reported as the "Hedonic Tone" for the odour sample. Respondents were also asked to provide information on the frequency, intensity, and duration of the offence.

Odour: Odour quality on a hedonic tone was ranked -9.37 versus an acceptable level of 4.5 (Figure 3.4). Odour was characterized by interviewees as nauseating, rank, obnoxious, and foul. The intensity was rated 2.33 on a scale of 0 to 3, where 0 = none; 1 = detectable; 2 = moderate; and 3 = extreme. The average duration of the odour was reported to be 1 to 6 hours for two cases, 6 to 12 hours for three cases, and 12 to 24 hours for six cases. The source of the odour was attributed to manure spreading (5 cases), manure storage (2 cases), wind direction (1 case), and the site in general (1 case).

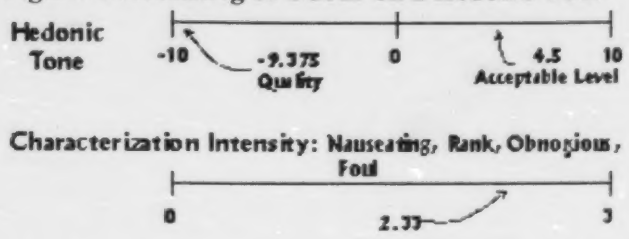
Suggested corrective actions included:

- use of odour reducing technologies, including injection into soil and covering lagoons with straw (8 cases); and,
- ensuring adequate pit capacity and site spreading selection to avoid building locations (2 cases).

There was one incidence of a filed odour nuisance complaint regarding spreading of manure and one of a nearly

filed complaint. Respondents provided no further detail on the complaints.

Figure 3.4 Ranking of Odour on a Hedonic Tone



Water Quality: The overall nature of concern relative to water quality was groundwater quality (6 cases), water availability and acquifer vulnerability (3 cases), groundwater supply (2 cases) and surface water quality (1 case). The suspected cause of the problem was attributed to:

- land application – runoff potential (2 cases), spreading distance from waterway (2 cases), nutrient overload (2 cases), application method (3 cases), and spreading distance from neighbour's domestic well (1 case);
- storage systems used for manure – construction method and lagoon design (2 cases), and placement with respect to water table (1 case); and,
- dead animal disposal method – preference to incineration (1 case).

Traffic: Traffic quality was rated at -2 on a scale of -10 to +10 in pleasantness of traffic quality, with one instance of a traffic complaint. The major concern focused on damage to roads and danger to children on the roadway.

3.2.5 Neighbourhood Benefits

In general, benefits such as enhancing the economic base and promoting economic development of the community were deemed more important than those related to population increase, taxes, or the impact the intensive livestock operations have on uniform product quality.

The importance of a hog operation to the community (on a scale of 1 to 5), was perceived to be the greatest for such benefits as helping agriculture remain the base of the community (3.78), promoting progress (3.40), job creation (3.37), reaping benefits before other counties encourage development (3.31), and the added benefit of manure fertilizer (3.53). Relative to the neighbour and his family, factors perceived to provide the greatest benefits included helping agriculture remain the base of the community (3.77), promoting progress (3.54), the added benefit of manure fertilizer (3.53), community involvement (3.18) and the attraction of processing infrastructure (3.15).

Figure 3.5 reports the importance of benefits of the hog expansion projects to the entire community, the immediate neighbours only (Figure 3.5(a)), and the surrounding neighbours (Figure 3.5(b)).

Figure 3.5 Importance of Benefits – Total Neighbourhood

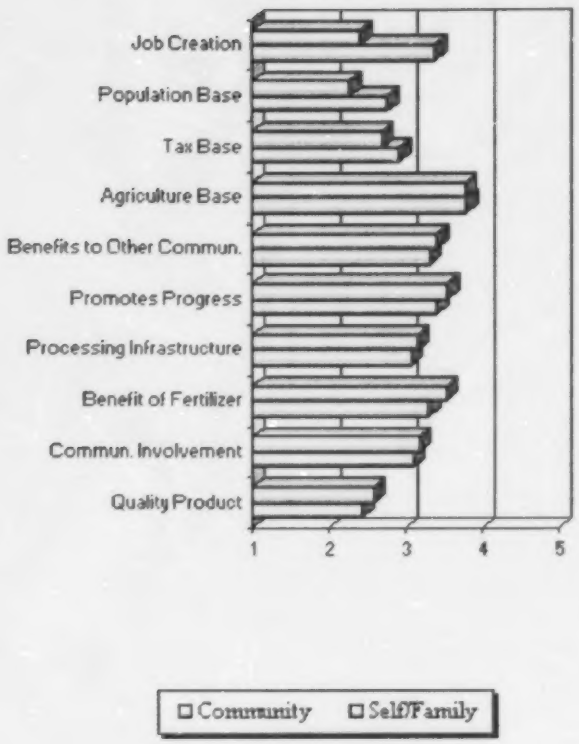


Figure 3.5(a) Importance of Benefits – Immediate Neighbourhood
(1.6 km diameter around case study site)

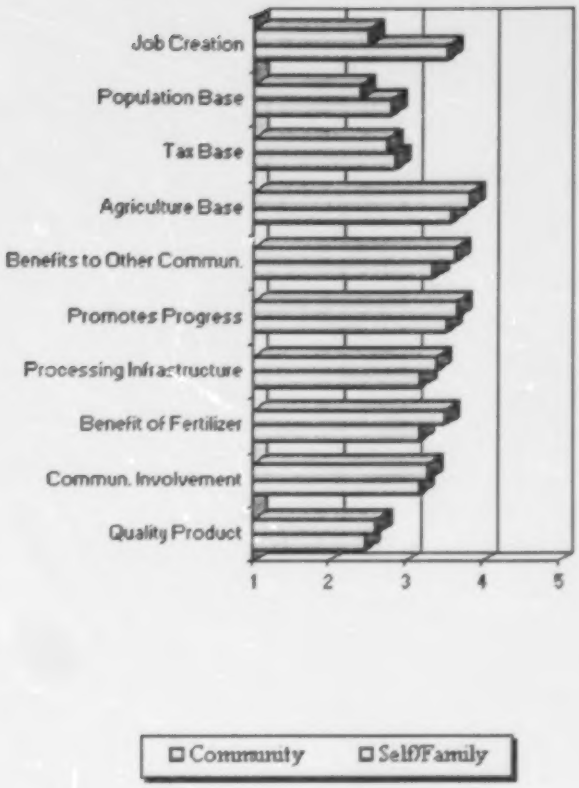
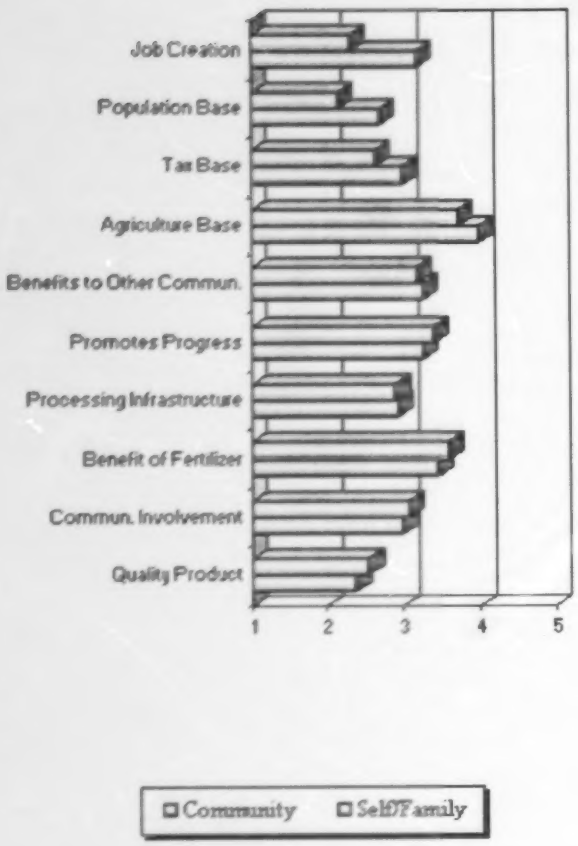


Figure 3.5(b) Importance of Benefits – Surrounding Neighbourhood
(1.6 to 4 km diameter around case study site)



3.3 Community Receptiveness And Components For Environmental Planning

3.3.1 Community Receptiveness

In the process of conducting the five community focus groups, common themes emerged relative to the perceived importance of agriculture to the community and general receptiveness to intensive livestock projects. These included:

- *Importance of Agriculture to the Community:* Agriculture plays an important role in the economic and social base of the community.

  Much of the business economy was dependent on agriculture for survival. This was considered to be the case in terms of the retail business in Lacombe, the concrete business in Lamont, and the trucking business in Barrhead. Schools, healthcare, churches, and recreational facilities were believed to be dependent on the rural

population for sustainability. Although communities like Lamont and Crossfield contained residents who commuted to other centres for employment, much of the local purchases were still dependent on farmers.

- *Changes in Previous Five Years:* Focus group participants noted a trend toward fewer larger-sized, specialized operations, with a greater business approach and bottom line orientation. Most of the newer enterprises were intensive livestock (dairy and hog). Crossfield citizens identified availability of farm land as a limiting factor to further growth of intensive operations. Crossfield constituents believed that many long-term residents were selling their properties to Hutterites, effectively removing the number of residents and their corresponding socio-economic contribution to the community, along with driving land prices up. This region also noted a greater presence of acreages, making the region less conducive for intensive operations due to inflation of land prices. The Barrhead region noted an influx of young European families, bringing new ideas and young children into their school system. Lamont constituents observed an increase in the amount of intergenerational transfer of property to younger children. All communities characterized younger farmers as educated, organized, and aware.
- *Taxes and Revenues:* Focus groups felt that taxes and revenues to Municipalities and Counties are having a greater influence in selection and support of development projects.
- *Spending Patterns:* Livestock operators and their families were perceived to have a high propensity to consume locally, although factors of age, selection of products/services, competitiveness, and distance to larger centres account for regional differences.
- *Receptiveness to Intensive Livestock Operations:* Intensive hog production was perceived to be the worst environmental offender of intensive livestock operations. In general, communities with acreages, new housing developments, or bedroom commun-ities are the least receptive. Receptiveness increases if one of the local residents is proposing the development (versus an outside investor), due to trust already present. Receptiveness also increases as the physical proximity to the development decreases. There was a lot of 'not in my back yard' thinking.

Several positive effects were attributed to intensive livestock expansion, including:

1. *Economic:* Significant economic benefit is recognized as contributing to local and regional communities, with spin-offs in the areas of accounting, legal, feed, retail, etc.
2. *Employment:* Increases in the number of jobs, youth employment opportunities (youth remaining in agriculture without ownership), demand for skilled labour, and several family units supported by one operation.
3. *Stability:* People are staying in communities and raising their families, thus contributing to long-term businesses.
4. *Specialization of Services:* Specialized intensive operations are leading to a demand for more specialized, high-value services.
5. Infrastructure Development: Intensive livestock operations were identified as making significant contributions in terms of volunteer hours to arenas, pools, curling rinks, etc.
6. *Value-Added Opportunities:* Livestock operations were viewed as providing alternative local markets for grain producers and value-added opportunities for the region. Value-added opportunities were identified for grain farmers, meat processing, and product development (hog genetics).

Conversely, several negative effects were attributed to intensive livestock expansion, including:

1. *Odour, Water, Soil:* Effects on community member quality of life was attributed to odour, especially during manure spreading, water quality (runoff and contamination), availability (aquifer depletion), and flies and insects. Media reports of health problems in southern Alberta were attributed to water quality concerns by residents. Prevalence of flies and insects at the facilities gave cause for citizens to be concerned with the spread of disease.
2. *Infrastructure:* Effects on road infrastructure and dust from the feed and livestock transport. Suggested steps

for developers to take are: haul in mornings, centralized gathering point, grader purchase, contribute dollars to road upkeep, etc.

3. *Lack of Provincial Environmental Standards:* Provincial codes of standards, and policing thereof, viewed as inadequate and inconsistent. Municipalities expressed the desire to have more input into the development of standards to allow for special characteristics of their localities. Municipalities felt that they should contribute to the administration of the regulations.
4. *Equalization of Tax Revenues:* Concern that large intensive operations are not generating a tax base for the municipality, however, they enjoy the benefits, e.g., road, water, services, fire department, etc. Alternative revenue or taxation equalization options should be considered which may be viewed as appropriate offsets to compensate for infrastructure maintenance.
5. *Negative Media:* There was an expressed need for media education surrounding the facts around intensive livestock operations. This was viewed as a joint government/ industry responsibility.

3.3.2 Components for Environmental Planning

Community members provided the following suggestions for incorporation into developers' plans:

1. *Focus on Neighbour/Community Relations:* Communicate the nature of the expansion plans, environmental standards, precautionary actions, and community benefits to neighbours and community members. Talk with neighbours to gain insight to their concerns and provide answers to their questions. Get involved with the community and demonstrate you are a 'good corporate citizen'.
2. *Public Awareness:* Set up forums whereby you have full disclosure of business plans and nutrient management plans. Advocate the economic benefits and how you plan to demonstrate professional and social responsibility.
3. *Environmental Management Plan:* Demonstrate that you are a lead agent in proactively addressing potential environmental risks by outlining what measures you are prepared to take to alleviate concerns.

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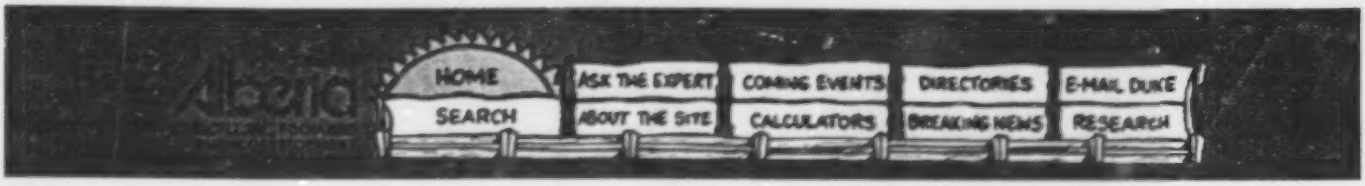

From Uncertainty To Practice - Implications To The Business Manager

Socio-Economic Impact Of Hog Operations In Alberta

[Development Of A Operator Package To Assist In The Expansion Process | What Are The Laws? | Involving Neighbours In The Plan?]

4.1 Development Of A Operator Package To Assist In The Expansion Process

Farmers today are expected to demonstrate how they can continue the development of agriculture in an environmentally responsible fashion. They must establish cases which illustrate how they plan to implement and monitor environmental protection measures for proposed expansion projects. The plans should indicate details as to how various measures have been taken or proposed to be taken, including cost components. Cost of measures for environmental safeguards should be treated as an integral component of the project cost and environmental aspects should be taken into account at various stages of the projects:

- conceptualization – preliminary environmental assessment;
- planning – detailed studies of environmental impacts and design of safeguards;
- execution – implementation of environmental safety measures; and,
- operation – monitoring of effectiveness of built-in safeguards.

A well-developed case can serve as a powerful tool for influencing public decisions made under highly uncertain conditions. Farmers must strike a balance between the science-based aspects of their plans and good neighbour policies (e.g., giving neighbours adequate notice as to where and when manure will be spread, keeping a reasonable distance from homes when spreading manure, incorporating manure into the soil as quickly as possible, and engaging neighbours in discussion to solicit their concerns).

The aim of such a package is to demonstrate how sound management of an intensive livestock operation can help promote, protect, and improve the environmental quality through use of best management practices. The package will serve to provide a guide to decision-makers for development planning, outlining the steps for dealing with environmental concerns.

Some of the questions that must be answered in the package are:

- What will be the direct and indirect economic impacts of my specific operation on our local community and the province (jobs, investment, revenue)? How do I leverage economic clout and advocate the advantages of size?
- How do efficiency, productivity, capacity, regulatory issues, and leadership factor into my site location?
- What are the primary sources and causes of odours from my swine operations (facilities, manure storage and treatment, land application, carcass disposal)? How can those odours be reduced or made less offensive? How do people respond to odour (control, understanding, context, exposure)?
- What are practical options for protection of water quality (siting, soil types, lagoon construction, runoff control systems)?
- How can I address the mutual concerns of individuals regarding property values, comfort, health and welfare, aesthetic amenities, and other quality of life issues?
- What are the risks or hazards to workers, animals, and buildings on my farm? How are they measured and monitored (ventilation, dietary amendments, odour control additives, waste management systems, land application, new technologies – biofilters, incinerators, catalytic converters, condensers)?
- What are my favourable site selection criteria and conditions (prevailing winds, buffers, setbacks, consideration of neighbouring land use, landscape)?
- How can I help improve communication with neighbours, community, and private interest groups?

One example of a Nutrient Management Plan, developed under the driving force of the Ontario Farm Environmental Coalition, focuses on the management of nitrogen, phosphorous and potassium, with consideration given to such associated environmental and social concerns as bacteria and odour. It includes elements of a good neighbour policy, soil testing, manure testing, crop requirements, application of nutrients, calibration of nutrient applicators, identification and mitigation of environmental risks, proper containment of nutrients, and contingency planning. Several components identified for an Ontario nutrient management strategy include:

- "soil testing for available nutrients using provincially accredited laboratories;
- manure testing for available nutrients using provincially accredited laboratories;
- identification of residual nitrogen sources based on previous agronomic practices;
- relation of added nutrients (fertilizer, manure, biosolids, etc.) to soil test results and nutrient requirements of crops being produced (information contained in OMAFRA Publication 296);
- assessment of application methods and timing to optimally apply nutrients (including supplemental fertilizers) for maximum efficiency of nutrient utilization by growing crops while minimizing leaching, runoff, and volatilization;
- calibrating manure and fertilizer spreaders to ensure that the application rate and placement is accurate (information sources include OMAFRA Publication 296 and Nutrient Management BMP Publication);
- identification and mitigation of environmental risk associated with managing agricultural nutrients (i.e., surface and groundwater protection through implementation of buffer zones, wellhead protection, separation distances, etc.);
- proper containment of agricultural nutrients while being stored (compliance with MDS II);

- contingency plans for use in the event of an unintended nutrient discharge (Environmental Farm Plan Contingency Plan serves as an example); and,
- manure spreading etiquette (good neighbour policies) that will minimize complaints relating to nutrient management practices."

4.2 What Are The Laws? According to a recent situation analysis completed by "The Hog Environmental Management Strategy (HEMS) Steering Committee, in Alberta, development of new or expanding livestock operations is controlled at the municipal level, however, procedures vary by municipality. Three key pieces of legislation are in place for hog production:

- The Agricultural Operations Practices Act, which provides protection from nuisance lawsuits if operators are adhering to accepted practices and not breaking any provincial regulations. The legislation falls under the responsibility of Alberta Agriculture, Food and Rural Development.
- The Alberta Environmental Protection and Enhancement Act which prohibits contamination of water supplies and release of pollutants into the environment. This Act regulates storage, collection, transport and treatment of waste products, and falls under the responsibility of Alberta Environmental Protection.
- The Water Act, currently under review, ensures responsible management of water resources and licensing of hog operations.

Finding out who has the authority to administer environmental laws may be difficult given that a number of government departments and levels are involved. Local governments have generally been responsible for implementing and enforcing, thus deciding on development applications, zoning and environmental impacts.

In accordance with information provided by Wilson & Company, Barristers and Solicitors, navigating the approval process is reliant upon the following steps:

1. Review Municipal Land Use Bylaw and Code of Practice:
    - municipal and legal requirements vary sign-ificantly from one municipality to another
    - not all municipalities adopt the Alberta Agriculture's Code of Practice – some municipalities have created their own standards; and,
    - follow the land use bylaw, keeping in mind that sometimes municipal staff will adopt policies that are not supported by the bylaw.
2. Site selection and community consultation:
    - decide on alternate sites early – there may be more community opposition to one site than another;
    - conduct preliminary inquiries regarding flood plains, water tables, soil permeability, and traffic issues;
    - talk to neighbours first – don't be afraid to talk to the media, but stress the community benefits of your development and your environmental management plans. Communi-cate with your neighbours about your plans and seek their input.
3. Development application:
    - include as much information about your site and project as possible;
    - keep in mind that the courts can overturn a Development Permit if they find that the

municipality did not have the proper information when it issued a Development Permit; and

- attach information on site design; prevailing winds; manure management; maps showing neighbours; traffic routes; manure spreading lands; and a description of economic benefits, environmental sustainability, and the community consultation undertaken.

4. Development Appeal Board and Court of Appeal:
   - be well prepared for the Development Appeal Board hearing – do not assume that the Board understands how hog operations are designed or operated – do not assume they will know the merits of your project – you or your counsel must persuade the Board to approve your project;
   - if there is an appeal to the courts, understand that the focus of the court's review is on the municipality's conduct – if the court finds that the municipality did not follow proper procedure, the courts can effectively overturn your Development Permit; and,
   - the court of appeal process can be time-consuming and costly – consider alternatives to defending your project in the courts – options may include selecting a new site or reapplying for a new permit – get knowledgeable advice when considering your options.

Figure 4.1 Overview of Municipal Approval Process

insert graphic here

4.3 Involving Neighbours In The Plan?

The greatest concern conveyed by neighbours and other community members centre around disruptions to their quality of life, primarily due to nuisance odours. Encouraging community participation in development plans helps build harmony. Several pointers which address community involvement include:

- *Getting to Know Your Neighbours:* People tend to fear and mistrust what they don't know. Getting to know your neighbours is a simple act that is very important. It facilitates discussion of concerns and can keep problems from escalating. Good communication builds trust and respect. As neighbours learn that you are approachable and interested in their concerns, they may be more likely to come directly to you rather than authorities to work out problems.
- *Being a Good Neighbour:* Attention to neighbour's interests and feelings reduces the potential for conflict with the community. Being a good neighbour involves being friendly, helping when needed, and being willing to accommodate their needs. In addition, it also means practicing responsible farm management through activities such as using cost-effective techniques to control odours, conducting soil tests and correcting application rates, notifying neighbours of your plans for injection or spreading of manure, and in general, demonstrating your commitment to high environmental standards and being considerate.
- *Keeping Your Farm Attractive:* The appearance of your operation plays a role in what neighbours think of your farm. Properly placed shelterbelts, and landscaping not only help appearance, but can serve to help control odours, reduce heat or provide shade, and enhance value.
- *Invite Neighbours Over the Fence:* Showing your farm and explaining its activities helps neighbours understand your business needs. They can gain an appreciation for such things as the

nutrient value of manure as a fertilizer and soil conditioner. Events such as farm tours, barbecues, and open houses help promote your business.

- *Being Active in the Community:* Involvement in community-level activities is good for relations and helps educate the public relative to the hog industry. Involvement can foster goodwill through assistance on community groups, participation in service clubs, sponsoring of local events such as sports teams or church functions. Goodwill can also be fostered by providing manure for neighbour fields and gardens. Community participation can also be strengthened by using local workers and supporting local suppliers and businesses.

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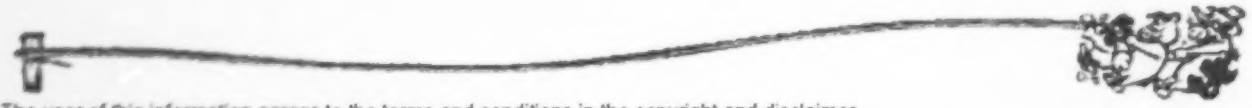

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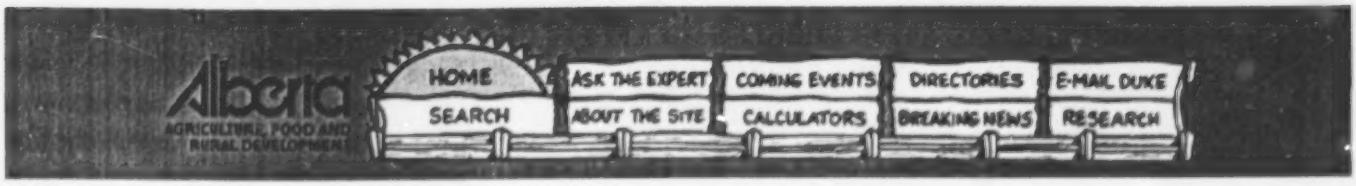

Socio-Economic Impact Of Hog Operations In Alberta

This study, the Socio-Economic Impact of Hog Operations in Alberta, was undertaken in two phases: The first phase of the study involved the development of a producer survey based tool to estimate industry-specific economic multipliers for the on-going hog operations in different types of rural communities. Benefits are estimated based on the number of employees, the number of additional jobs that this spending supports and the income generated by the spending. The second phase of the study relies upon the application of multipliers to five specific expansion and/or investment projects to quantify the magnitude of economic benefits; interviews with immediate and surrounding neighbours of the case studies to help clarify the nature and specific source of any concerns; and community focus group meetings within the case study communities to further supplement the social and environmental management information materials.

The project was funded by the Alberta Pork Producers Development Corporation (APPDC) and Alberta Agriculture, Food and Rural Development (AAFRD). The Canada/Alberta Hog Industry Development Fund, a new Federal-Provincial Industry Development Fund administered by the Alberta Pork Producers Development Corporation, financially supported this study with a grant. The Agriculture and Food Council of Alberta have financially supported this study by a grant from the Canadian Adaptation and Rural Development Fund that it administers on behalf of Agriculture and Agri-Food Canada.

The consulting team would like to acknowledge the assistance provided by AAFRD, especially Ms. Louise Starling and Mr. Murray Davison of the Livestock Expansion and Development Team, in conducting the neighbourhood surveys and community focus groups. Any errors, omissions or mis-interpretation remain the responsibility of the consulting team.

A large number of industry stakeholders, producers and specific community members, provided their valuable time to meet and share their production and market information and their perspectives and concerns regarding expansion of intensive livestock operations. It is this information which forms the basis of our report. Although it is not possible to convey all the comments made during the process of this investigation, it is our opinion that the report reflects a fair representation.

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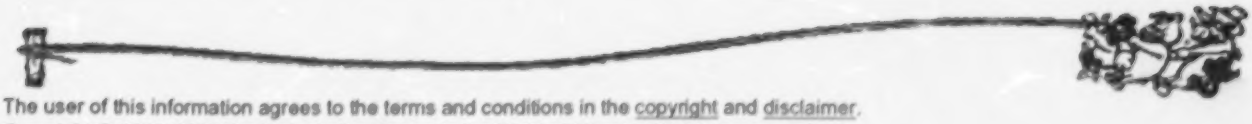

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